DOCUMENT RESUME

ED 021 573 LI 000 715

PROPOSED COMPUTER SYSTEM FOR LIBRARY CATALOG MAINTENANCE. PART I, SYSTEM DEFINITION.

New York State Library, Albany; Stein (Theodore) Co., New York, N.Y.

Pub Date Apr 67

Note-109p.; Part II, System Design is LI 000 716

EDRS Price MF-$0.50 HC-$4.44

Descriptors-CATALOGING, COMPUTERS, COOPERATIVE PLANNING, DATA COLLECTION, INFORMATION PROCESSING, INFORMATION SYSTEMS, INPUT OUTPUT, INTERINSTITUTIONAL COOPERATION, *LIBRARY COOPERATION, *LIBRARY TECHNICAL PROCESSES, NETWORKS, SHARED SERVICES, STATE PROGRAMS

Identifiers-Machine Readable Cataloging, *New York, MARC

A processing center which would meet both the cataloging and acquisitions needs of the public libraries of New York state has been proposed. The part defined in this report is a computer-based catalog preparation system, capable of producing both book and card form catalogs. It was designed with the objective of providing sufficient flexibility (by use of special control parameters) to meet the requirements of both research libraries and general public libraries and to allow the testing of various procedures in practice. The functions of the system can be divided into three general categories: input, output, and computer processing and related operations. The input to the system is either through a manually prepared worksheet upon which is written the descriptive cataloging data or through utilization of machine-readable bibliographic data. Outputs of the system, other than catalog cards in the traditional format and book catalogs, are supplements to the basic catalog and various error listings and other administrative records. Specifications and instructions for completing the cataloging worksheet are given, as is information relating to the handling of the various cataloging elements used to generate a catalog entry. Procedures related to computer processing of the data are also discussed. (CM)

LI000715

ERIC/CLIS
JUL 11 '68
UNIVERSITY OF MINNESOTA

PROPOSED COMPUTER SYSTEM FOR LIBRARY CATALOG MAINTENANCE
PART I: SYSTEM DEFINITION

SUBMITTED TO THE NEW YORK STATE LIBRARY
BY THEODORE STEIN

APRIL 1967

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

THE UNIVERSITY OF THE STATE OF NEW YORK
THE STATE EDUCATION DEPARTMENT
THE NEW YORK STATE LIBRARY
ALBANY, NEW YORK 1967

NYS
1818
1968
LIBRARY

ED021573
LI000715

THE UNIVERSITY OF THE STATE OF NEW YORK

Regents of the University (with years when terms expire)

1969 Joseph W. McGovern, A.B., LL.B., L.H.D., LL.D., *Chancellor* - New York

1970 Everett J. Penny, B.C.S., D.C.S., *Vice Chancellor* - White Plains

1978 Alexander J. Allan, Jr., LL.D., Litt.D. - Troy

1973 Charles W. Millard, Jr., A.B., LL.D. - Buffalo

1972 Carl H. Pforzheimer, Jr., A.B., M.B.A., D.C.S. - Purchase

1975 Edward M. M. Warburg, B.S., L.H.D. - New York

1977 Joseph T. King, A.B., LL.B. - Queens

1974 Joseph C. Indelicato, M.D. - Brooklyn

1976 Mrs. Helen B. Power, A.B., Litt.D. - Rochester

1979 Francis W. McGinley, B.S., LL.B. - Glens Falls

1981 George D. Weinstein, LL.B. - Hempstead

1980 Max J. Rubin, LL.B., L.H.D. - New York

1971 Kenneth B. Clark, A.B., M.S., Ph.D. - Hastings on Hudson

1982 Stephen K. Bailey, A.B., B.A., M.A., Ph.D., LL.D. - Syracuse

President of the University and Commissioner of Education
James E. Allen, Jr.

Deputy Commissioner of Education
Ewald B. Nyquist

Associate Commissioner for Cultural Education
Hugh M. Flick

Assistant Commissioner for Libraries
John A. Humphry

Director, Division of Library Development
Jean L. Connor

PROPOSED COMPUTER SYSTEM FOR LIBRARY CATALOG MAINTENANCE
PART I: SYSTEM DEFINITION

SUBMITTED TO THE NEW YORK STATE LIBRARY
BY THEODORE STEIN

APRIL 1967

THE UNIVERSITY OF THE STATE OF NEW YORK
THE STATE EDUCATION DEPARTMENT
THE NEW YORK STATE LIBRARY
ALBANY, NEW YORK 1967

ORKING COMMITTEE ON A GENERAL SYSTEM FOR COMPUTER CATALOG MAINTENANCE

dwin Albrecht
ew York State Education Department

rs. Grace Baines
uffalo and Erie County Public Library

rs. Mortitia-Leah Frederick
ew York Public Library

rs. Sydney Marcu
ew York Public Library

iss Genevieve Oswald
ew York Public Library

ichard Pfefferle
assau Library System

Joseph Rosenthal
New York Public Library

Paul St. Pierre
Rensselaer Polytechnic Institute

Chairman: Peter J. Paulson
New York State Library

Secretary: Lynn Hard
New York State Library

FOREWORD

As part of its budgetary appropriation for 1966/67, the New York State Library was mandated to "develop statewide and regional plans to improve library services..." and "...to develop means of utilizing data processing, information storage and retrieval techniques, communications devices, and other improved management practices for this purpose." The systems detailed in this report, and in the companion report entitled Centralized Book Acquisition for New York State, are part of the response to that mandate.

The study which led to the present publication was begun in 1966, when it became apparent that a number of libraries in New York State were considering or planning computer-assisted cataloging systems. Besides the New York State Library, the New York Public Library had expressed a desire to use computer techniques for the publication of a catalog of its Dance Collection, and to consider using such techniques to solve the problem of its rapidly deterioratating card catalogs. In addition, the report of Nelson Associates on Centralized Processing for the Public Libraries of New York State (1966) had recommended a single acquisitions and cataloging center for the public library systems of New York State, and had suggested extensive use of the new computer technologies in such a center. This project has attempted to develop, then, a general system for computer catalog maintenance, without reference to the specific requirements of a particular library.

For this reason, one of the basic criteria for the system has been a certain flexibility in both input and output formats. Not only was such flexibility deemed essential to enable the system to serve the needs of a wide variety of libraries, but it was also felt to be important in meeting the descriptive requirements of a wide variety of library materials.

During the time that this system was being developed, the MARC project at the Library of Congress was still in its experimental stages. Although final MARC codes and formats are still not available at this writing, acceptance of MARC tapes as input was also made a requirement of the system design. Unless there are strong reasons for local variation, it is expected that most users of this system will adopt the same codes, symbols, and descriptive elements as MARC. The most obvious advantage of such an approach is the efficient and economic use which may be made of catalog data supplied by the Library of Congress in machine-readable format, but an additional advantage will be the facility with which data and staff may be exchanged between user-libraries.

The problem of filing rules was regarded as outside of the scope of this particular project, although a filing rule program will be needed before the system can be implemented. It is hoped that work now being done at the Library of Congress and elsewhere, as well as studies being planned by the New York State Library, will bring progress in this area.

The present system has been designed to articulate fully with the acquisitions system described in Centralized Book Acquisition for New York State: Proposed Computer System.

Grateful acknowledgement is made to the staffs of the Information Systems Office of the Library of Congress, the New York Public Library, and the New York State Library for their cooperation and assistance. We are especially grateful to those who served on the Working Committee for their generous contributions of time and talent, and for their patience throughout many long hours of meetings. Final responsibility for the details and decisions embodied in this report rests, of course, with our consultants, the Theodore Stein Company.

Peter J. Paulson
Principal Librarian

New York State Library
Albany, New York
January 1968

THEODORE STEIN

TABLE OF CONTENTS

Page

INTRODUCTION 1

NOTES ON TERMINOLOGY 4

SPECIAL SYMBOLS 5

I. INPUT 6

THE CATALOG WORKSHEET

General Discussion 8
A Model Catalog Worksheet 11
The General Catalog Worksheet 20
Filing Form and Printing Form 26
Use of Special Symbols 27
Making Changes to the Catalog Entry 31

THE INPUT CONTROL NOTICE 32

THE DELETE WORKSHEET 36

THE AUTHORITY FILE WORKSHEET 37

Use of the Authority File Worksheet 47
Established Form Change 48
Effect of Changes and Deletions 48

THE SPECIAL REQUEST NOTICE 51

THE NEW TITLE NOTICE 52

II. OUTPUT 54

THE BOOK CATALOG 55

The Conditions for the Occurrence of Catalog Components 55
The Sequence of the Catalog 57
The Content of Catalog Components 60
The Format of the Catalog Entries 63
The Divided Catalog 68

Page

II. OUTPUT (CONTINUED)

CATALOG CARDS 70
THE CATALOG LIST 72
THE OUTPUT CONTROL NOTICE 73
Coding the Output Control Notice 77
THE AUTHORITY FILE LIST 83
AUTHORITY FILE AUDIT LIST 86
PROOF COPY AND ERROR LIST 88
ERROR REGISTER LIST 91
III. COMPUTER PROCESSING AND RELATED PROCEDURES 93
THE SCHEDULE 93
CLERICAL AND ADMINISTRATIVE PROCEDURES 94
PROCESSING OF LIBRARY OF CONGRESS INFORMATION 96

FIGURES

1. CATALOG WORKSHEET 48
2. INPUT CONTROL NOTICE 53
3. DELETE WORKSHEET 56
4. AUTHORITY FILE WORKSHEET 59
5. ESTABLISHED FORM CHANGE NOTICE 60
6. SPECIAL REQUEST NOTICE 61
7. OUTPUT CONTROL - CONTENT NOTICE 77
8. OUTPUT CONTROL - SEQUENCE NOTICE 80
9. OUTPUT CONTROL - FORMAT SPECIFICATION NOTICE 81

INTRODUCTION

The system specified herein is a general purpose computer-based catalog preparation system capable of producing both book and card form catalogs. It has been designed with the objective of providing sufficient flexibility (provided by special control parameters) to meet the requirements of both research libraries and general public libraries.

The specific objectives of the project were as follows:

1) To design a computer system to maintain library catalog information in machine storage and to produce catalog cards and book catalogs from the machine file.

2) To design the system so that variations in the content and format of printed catalog entries can be indicated by means of control records submitted at the time of printing. In particular, to allow entries to be shortened by omitting from the printed form of the entry some of the information that is on the catalog file.

3) To design the system so that variations in the content of the basic bibliographic data can be accommodated. In particular, by use of certain control records it should be possible to introduce new elements into the catalog records, eliminate certain elements from the catalog record, or change the way in which certain elements are processed.

4) To provide for coded data whenever it seems that, in the future, it may be desirable to search the machine file and extract data based upon code values.

5) To allow for the use in the system of machine readable catalog copy received from the Library of Congress.

6) To take into consideration in the system design the provisions needed for later connection of this system with an acquisitions processing system and to so design the system that reprogramming of the cataloging portion of the system, except for addition of certain routines, will not be necessary when acquisitions are included.

In addition to the above specific objectives, the system is to be designed with sufficient flexibility to allow the testing of various procedures in practice. It is felt that certain decisions can only be made based upon experience and that the capacity to adapt the procedures as experience is gained is valuable.

The functions of the system as specified can be divided into three general categories:

A. Input
B. Output
C. Computer Processing and Related Operations.

Each of these categories will be briefly described below, and full descriptions are presented in subsequent sections.

A. Input

The inputs to the cataloging system are of two types:

1. Cataloging information which includes bibliographic descriptions, authority data, etc. not differing from traditional information worked with under the present manual system.

2. System Control information which provides parameters to general programs that will, under control of this data, generate proper catalog entries, create and maintain specified files, and produce desired output.

The cataloging infromation can be entered into the system in two forms - either in machine readable form as in the case of Marc magnetic tapes presently being prepared by LC, or as completed work sheets prepared manually by the library's cataloging staff. The way in which the system will handle machine readable catalog copy will be described in the section that discusses computer processing. Manually prepared cataloging data will be transcribed by the cataloging staff onto defined work sheets - catalog or authority - and will be inputted to the computer system for machine manipulation. The information supplied to the system will contain full descriptive cataloging, instructions for generating catalog entries, and any descriptions deemed necessary for selective retrieval. Full specifications plus instructions for completing the work sheets are presented in the subsequent section.

For a large scale statewide cataloging center, information will probably be inputted to the computer system using a page reader. This will eliminate the need for paper tape punching of cataloging data. However until such time that new equipment is purchased and a center established, any pilot or individual library projects will necessarily need some form of keyboarding, and paper tape seems to be best.

B. Output

The basic output of the system is the catalog - the data will be printed either on cards or on masters for book production. For both book and card catalogs, the information to be printed and format are controlled by parameters supplied by the library staff. For the traditional card or specified book form catalog the programs will be instructed to pick up the necessary records from the catalog files, supply proper headings, edit, and print. For selective printing (asubject catalog only, for example) the program will be under control of parameters supplied by the requesting library. A full description of the output control notice is presented in the output section.

The catalog cards will follow the traditional format with only minor changes in format and typeface. All of the information currently printed on cards will be printed by the computer printer. Headings will be supplied and the cards will be delivered from the computer printer already alphabetized.

For book form catalogs, the recommended method is for the main entry only to carry complete information. All added entry and subject entry tracings will be condensed (as instructed by the output control notice). If the library decides to change the form of the book catalog, then a new output control notice must be submitted requesting the change.

In the output section there is presented a description of the output and its relation to input, i.e., a description of the way the system will handle all of the inputted cataloging elements in order to generate a catalog entry. For example, how the computer will pick up an added entry heading from the master file, duplicate the catlog record, transfer the heading and print. Another example is the treatment of established forms. Once an element is established, it is unnecessary for the cataloger to transcribe the full descriptive information such as special instructions, printing or filing forms, etc. All that is entered on the catalog work sheet is the identifier or heading under which it has been established. The computer will search the authority files for a match and supply all necessary data automatically. The procedure used in these and similar cases is fully described.

C. Computer Processing and Related Operations

The system is designed to accept and edit the input, update and maintain files containing cataloging information, manipulate and sort information, edit and print the output.

The discussion presented in this section will be limited to a general description of the procedures related to computer processing, which will be clear to non-computer personnel. It will include the way in which LC copy will be treated and combined with library worksheets, the clerical and professional procedures associated with input and output worksheets, proofcopy, error listings, etc., and the general functions of the system.

A separate technical memorandum is being prepared for computer personnel which will contain flowcharts, descriptions, record layouts and formats, etc., and all information necessary for programming the system.

NOTES ON TERMINOLOGY

ITEM The word "Item" is used to refer to the object that is being cataloged. Items may take a variety of forms - books, serials, films, phonorecords, pictures, etc.

ENTRY An entry is a unit of catalog information generated for an item. An item generally gives rise to more than one entry - author, subject and title entries.

MAIN ENTRY Unfortunately there is an ambiguity in the use of this term in library circles. One use of the term refers to the first portion of the bibliographical description. This portion may contain the name of the author or authors of the item, or its title. The other use refers to that particular type of catalog entry which has been generated for the principal author or title. Both senses of the term are used in these specifications. The context will make it clear which meaning is intended.

RECORD In concept, the record is analogous to the unit catalog card. A catalog record is represented either as the data transcribed on a completed catalog work sheet, or as the data stored in the computer system; i.e. the machine readable catalog record.

ELEMENT A catalog record is composed of a series of elements; i.e. each distinct piece of information such as author, title, publisher, place of publication, etc., is considered a separate element. Each element will be uniquely numbered to facilitate transcription by the cataloger, keyboarding by the typist and recognition by computer.

SPECIAL SYMBOLS

▲	Element Divider
△	Major Element Subdivider
∏	Minor Element Subdivider
△̸	Exception Element Subdivider
ᵽ	Delete Symbol
⌈ ⌉ ↓	Editing Marks for Generating Filing Form
⟨ ⟩	Angle Brackets for Control and Description Codes
ƀ	Blank Element
¶	Paragraph Symbol

The shapes given for these symbols have been chosen for editorial purposes in this report. The actual shape used is of no importance. In a specific situation a shape should be chosen, if possible, that matches an available symbol on a special symbol key of the input device in use.

I. INPUT

In a general way, the cataloging procedures currently followed by most libraries are quite similar. The cataloger will enter full bibliographic description onto a cataloging worksheet. The completed sheet will be passed on to a typist who is familiar with the format and style of the particular library. After typing and proofreading, the card is duplicated for the correct number of entries, and headings are transferred to the proper position on the card.

Under a computer system, the concept remains quite similar, with a minimum of manual intervention once the catalog sheet has been inputted to the computer. However, the computer system must be supplied with basic bibliographic data in combination with rules on how to treat the data. Bibliographic data is supplied on the worksheets, and rules for working with this information are supplied on the system control input notices.

The following inputs will be used:

1. Catalog worksheet
2. Authority file worksheet
3. Delete worksheet
4. Input Control notice
5. Output Control notice
6. Special request notice
7. New Title notice

The catalog worksheet is used to enter any new cataloging information, or to make changes to existing cataloging data already in the system. It can also be used to set up an established form on the main authority file.

The authority file worksheet is utilized in setting up, changing, or deleting established forms as they are maintained in the computer system. Two types of authority files are maintained. The main authority file contains subjects and names - personal and corporate, and established forms for all subheadings that may be used in combination with any main headings. The auxiliary authority file is intended for use with elements which do not generate catalog entries, but have been assigned established forms or codes; for example, if a library were to code language, physical form, or publisher, then the established codes and their respective printing forms would be carried on the auxiliary authority file.

The delete worksheet will be used to withdraw items from the catalog file.

The input control notice is prepared by the library to inform the computer system of the way each element is to be treated. The allowable codes, the proper authority file if established, entry generation information, etc. are all coded onto the input control notice. The computer utilizes this information in generating the machine readable catalog record.

The output control notice is used to describe to the computer system the content and format of the printed catalogs. It controls which elements are to be printed and how the printed elements are to be sequenced and formatted.

The special request notice is entered in case the cataloger needs extra catalog cards, proof copy and error diagnostics, or desires to change the time delay prescribed, before a catalog or authority entry is automatically included into the computer files.

The new title notice is submitted to the computer system for all items that are to be cataloged. The computer files are searched for matching LC copy and if it is found the LC information is printed as proof copy for review. Any change deemed necessary by the reviewing cataloger is entered on a catalog worksheet.

Following the general description presented below, each of the inputs will be described, a sample will be presented, and a full description of how the sheet is to be used will follow. The output control notice will be discussed at the end of the output section.

The general procedure for cataloging an item is as follows: A staff memberenters a new title notice to find LC copy, and if it is not found, will himself transcribe all bibliographic information plus the necessary indicators and codes onto the catalog worksheet. This worksheet data is inputted to the computer, where it is edited and transformed into a machine readable catalog record. This editing is accomplished by a computer program which uses as its parameters the information previously entered on the input control notice. The input control notice tells the program how to treat the catalog worksheet elements in setting up the machine readable catalog record.

In actual computer processing, the computer is instructed to first consider information which pertains to the authority files, received either by an authority file notice or an indication on the catalog worksheet that a new form is to be established. After the authority files have been updated, the established items in the machine readable catalog record are matched against the authority files; if no errors are found, the necessary catalog tracings are generated. In order to sequence properly, edit, and format the catalog record, the computer program utilizes the information contained in the output control notice previously entered into the system. Just as the input control notice tells the program how to transform a catalog worksheet into a machine readable catalog record, the output control notice tells the computer how to transform the machine readable catalog record into a form for printing the catalog output. Included in the description are the elements that are to be printed, the sequence of the elements in the catalog entry, the typographic codes, spacing, and all information necessary to prepare a printed catalog. After the editing is completed the computer will print the catalog either on cards or pages, as specified by the output control notice.

In the following pages each of the inputs will be fully described. Examples and instructions for use will also be presented.

THE CATALOG WORKSHEET

General Discussion

The preprinted catalog worksheet is used by the cataloger to transcribe all cataloging information necessary to generate a catalog entry. This includes descriptive cataloging in the traditional sense, and codes necessary for computer manipulation of the data. Each distinct piece of data such as author, title, publisher, etc. is entered onto the prenumbered sheet in the designated element position following the element number. Each element has a unique element number with which it is identified. The cataloger refers to this number when making changes to a catalog entry; the input control notice is coded for each element number separately; the output control notice refers to the information about each element by its element number and the computer will generate separate logical divisions for each element number.

If any codes are needed to control computer manipulation of the elements or to define characteristics of the elements, these are entered immediately after the element number. Examples of codes used with elements are given in the description of a model catalog below. In most cases codes are needed. For most elements it is possible to predetermine the relevant element characteristics and the required computer processing. Thus nothing need be written on the catalog worksheet other than the content of the element itself. For established elements, description codes are usually required. However, these need be entered only at the first establishment of the element. From this point on the description codes are kept on the machine authority file and need not be entered again.

Following the codes, or following the element number if there are no codes, is the actual data provided by the element, such as the author's name, title, publisher, place of publication, etc.

If an entry to the catalog will be generated for this element, the computer must know where to file that entry. A machine sort into strict alphabetic sequence will not be satisfactory, since library filing rules specify many deviations from such a sequence. As far as it is reasonable to do so, the machine program for filing will accommodate the special rules.

The extent to which this can be done has not yet been determined. However, there is a strong likelihood that not all of the filing rules will be accommodated. In order to deal with those cases not covered by the machine program, a filing form will be given by the cataloger. This is a re-spelling of the element statement in a way which will make the element file in accordance with the rules. This re-spelling would involve such things as spelling out abbreviations, omitting words, or inserting numbers in order to sequence words that have been assigned a rather arbitrary order (such as honorary titles).

The cataloger will have to be familiar with the filing rules that are covered by the machine program so that he will know when he must provide a special filing form. Very likely, the special filing form will also have to be written in a certain number of exceptional cases where the programmed rule is to be countermanded. (For instance, the program would undoubtedly drop the word "the". In an exceptional case, this might not be desired.). It is expected that a sufficient portion of the filing rules will be programmed so that the cataloger will seldom have to resort to a re-spelling.

In the case where the filing is based on an established form, it will not be necessary to supply a filing form each time a catalog work sheet is prepared. If a filing form is needed, it will be supplied at the time the established form is set up. This filing form will be recorded in the machine authority file and the machine will supply it whenever it is needed. Thus, filing forms need not be supplied for established authors and subjects, except at the time at which they are established.

In certain cases it may also be necessary for the cataloger to enter a special printing form. This is used when it is desired to have one form for printing and a different form for searching by the machine. An example of this will be given later in the discussion of the "date" element in the model catalog worksheet which is described below.

There will be cases in which it will be desirable to divide the element into subelements. One purpose of this subdivision is to allow the use of headings combined with subheadings without separately establishing every heading - subheading combination on the main authority file. Another use is to allow an element to be divided into portions, so that only a portion of the element need be printed if desired or so that one portion of an element can be printed in a different type style than another portion. A third use is to mark off portions of an element which have special significance to the program which interprets the filing rules. This division is accomplished by use of special symbols which will be called element subdividers. Thus, an element subdivider can be used to distinguish the main portion of a subject heading from the geographic division. A subdivider can be used to divide a title element into title and title extension. It can be used to separate the established part of an established series title from the portion which gives the issue number. Element subdividers can be used to divide an established name into portions such as honorary title and date.

CATALOG WORKSHEET

B.C. | Item Number (12 Card No) | 01 Classmark | 02 Second Classmark

03 MAIN ENTRY STATEMENT (Except Title Main Entry) [illegible]

04 CONVENTIONAL TITLE (9)

05 TITLE STATEMENT(6,7)

06 EDITION STATEMENT

07 PLACE OF PUBLICATION | 08 PUBLISHER

09 DATE OF PUBLICATION | 10 Second Date [illegible]

11 PAGING | 12 ILLUSTRATION [illegible] | 13 SIZE

14 SERIES STATEMENT (6,7)

15 NOTES

16-19 Tracings

Element Number	Classification	HEADINGS

20 LANGUAGE | 21 Second Language [illegible]

22 PHYSICAL FORM [illegible] | 23 BIBLIOGRAPHIC FORM [illegible]

24 BIBLIOGRAPHY | 25 COLLECTION CODES

FIG. 1 A MODEL CATALOG WORKSHEET

THEODORE STEIN

A Model Catalog Worksheet

The computer system is designed to accept a wide variety of catalog worksheet formats with any number of elements in any sequence as long as the structure of the individual elements is governed by certain rules. The general structure of an admissible catalog worksheet element will be given in the following section. This general structure accommodates a very wide range of requirements. However, in order to make clear the use of the catalog worksheet, a specific example will first be given. A model catalog worksheet will be defined in which specific decisions have been made about the elements to be included in the catalog worksheet, about the precise structure of each element, and about all allowable codes. In examining the worksheet and the data which it contains, it should be remembered that this is an example and that the use of the computer system is not restricted to the types of data or methods of data entry presented in the example.

The parts of the catalog work sheet (see Fig. 1) are considered in this discussion in normal page order, i.e., left to right and line by line beginning at the top.

The first box at the upper left hand corner will always contain the initials CW. This stands for Catalog Work sheet and is used to differentiate this form from others used in the system, such as an Authority File work sheet. No information is entered in this box.

In the second box one of the two letters which appear there in should ordinarily be entered : N(NEW), or C(CHANGE). N(NEW) represents the ordinary instance of an item being entered for the first time into the system. C(CHANGE) is used to indicate some form of recataloging, such as adding additional information (successive volumes of a book set), deleting any part (but not the whole) of the bibliographic record for an item, or correcting errors. (In order to delete all of the bibliographic record for any single item, the Delete Notice should be used).

One other entry can be made in this box under special circumstances. If an item has already been cataloged without the aid of Library of Congress copy and Library of Congress copy is received later, the machine will print out a proof sheet showing the contents of the Library of Congress copy. If the cataloger decides to change the cataloging to conform to the Library of Congress copy, then he can either enter a normal change worksheet marked "C", entering in only those elements which he wishes to change in accordance with the Library of Congress copy, or he can enter a change worksheet marked "L". This means that he wishes the Library of Congress copy to supersede the previous catalog record entirely, except for any changes noted on the catalog worksheet. When the code "L" is used, the changes on the catalog worksheet are regarded as changes to the Library of Congress catalog record, rather than as changes to the locally prepared catalog record.

Item number (LC card no.): This number is the unique number assigned to each item represented in the system. Whenever there is a Library of Congress card number available for the item being catalogued, the item number will consist of the LC card number. In cases where there is no LC card number available when the item is catalogued, an arbitrary number will consist of special symbols (to be decided).

To change an item number, enter the new number immediately after the old number, separating the two by a comma.

3) CLASSMARK. The classification number to be used is entered here.

Whether the LC or Dewey number is to be taken as given on the LC record will depend on the individual library's policy.

4) SECOND CLASSMARK.

May be used for an additional classification number if needed, such as additional copies in other locations, or a single item in book and microcopy form. May also be used by a library desiring to create both Dewey and LC classification in its records.

5) MAIN ENTRY (EXCEPT TITLE MAIN ENTRY).

The main entry, except title main entry, is entered here in the exact form in which it is established or is to be established. Generation of a catalog entry will occur with this line used as the heading. This form will also print in main entry position of the body of all catalog entries generated for the item.

Only established names are allowable in 5). Therefore any name entered here must have been previously established, or must be established on an authority file work sheet entered along with the catalog work sheet by checking "N" on the work sheet. If "N" is checked on the catalog work sheet, then one of the codes described below must also be checked.

The codes used to describe the main entry statement may be chosen to suit the particular needs of the user library, or they may be MARC codes. A set of codes discussed by the Hershey Committee are the following:

○ anonymous classic
○ miscellaneous corporate body
○ proceedings of a conference or symposium
○ government agency
○ personal name
○ society or institution
○ uniform heading

Several codes may be checked for one main entry statement if they apply. For example, the proceedings of a conference sponsored by a government agency might require P, G as its codes.

Subheadings, filing and printing forms may also be entered for the main entry statement. Element subdivisions may be used with the main entry statement, as described later.

04. CONVENTIONAL TITLE.

The established form of the conventional title is entered here; this is an established element and may be established for the first time by checking "E".

As a result of proper coding of subject control entries, the conventional title can appear in the catalog as a subheading to the main entry, and can be printed in the body of the entry surrounded [ ] brackets.

05. TITLE and TITLE EXTENSION.

All parts of the title up to but not including the edition statement are entered here. This is a non-established element and will be used only for printing. No title entry will be generated unless the "T" or "M" is checked. Checking "M" will cause the generation of a title main entry(in this case the main entry statement 03 will be left blank); a checked "T" will generate an added entry under the title. The element subdivider, [illegible] , is placed between the title to be traced and the title extension.

A filing form may be entered in element 05 if it is necessary to change the form of the title in sequencing.

If an additional title is to be traced, it must be entered as element 10, See below.

06. EDITION STATEMENT

The edition statement as it is to appear in the catalog is entered here. This is a non-established field and will be used for printing only.

07. PLACE OF PUBLICATION, 08. PUBLISHER.

The place of publication is entered in 07, the publisher is entered in 08, as they both are to appear in the catalog. These are non-established fields.

In case of a complicated imprint statement which is not easily adaptable to entry in elements 07 and 08, the information most appropriate to these elements is extracted and entered in 07 and 08, and the rest of the imprint statement is entered as part of the notes in element 13.

For example, if the title page reads:

New York, Harper & Bros, published for the Humane Society of Bogota, New Jersey.

enter in 07: New York
enter in 08: Harper & Bros
enter in 13: Published for the Humane Society of Bogota, New Jersey.

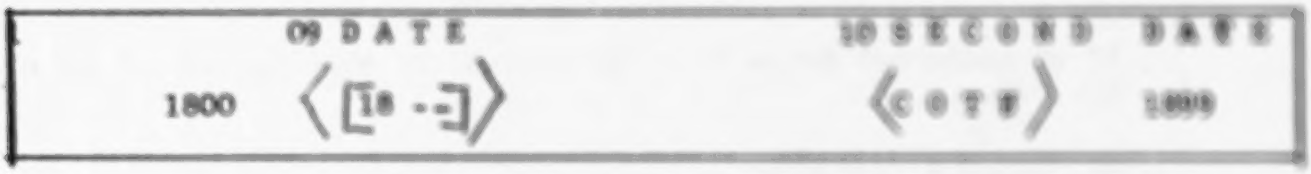
09 DATE, 10 SECOND DATE

The date of publication (or the date as specified in the appropriate catalog rules) is entered in 09. If the rules call for a second date, it is entered in 10. The dates are non-established fields, but will be written in standard date format so that searching, retrieval, and filing may be done on date.

The second date, when used, may be described by checking the appropriate box in element 10. The following codes are used:

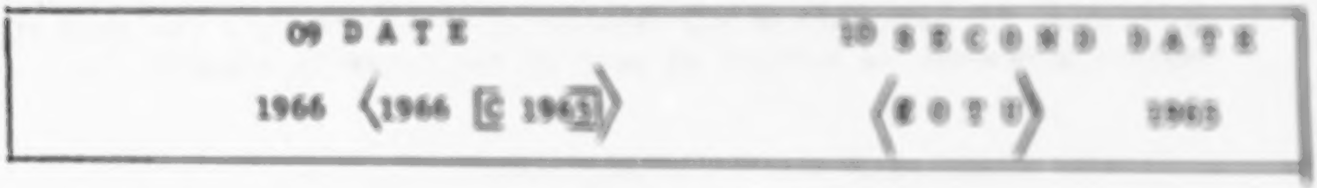
C - copyright date
O - original publication date (item is a reproduction)
T - terminal date (second date of multiple publication date)
U - upper limit (second date where one or more of the digits in the imprint date is missing. See example below)

If the date of publication is not known, both elements are left blank. An example of the use of the above codes is as follows: Imprint date has one or more digits missing.



The date that will be printed in the catalog is enclosed in brackets in element 09, namely 18 - -. For searching purposes, the program will consider the date to be in range of 1800 to 1899.

It is not intended that the second date be printed. Printing will be done from element 09. The procedure then is for the date of publication to be entered in 09, any second date in 10, and a printing from (combining the information contained in 09 and 10) after the date in 09. For example, a book published in 1966 and copyrighted in 1965 will be entered in the following way, if it were desired to print both dates:



11 PAGING.

The pagination statement as it is to appear in the catalog is entered here. This element is not established and will be used for printing only.

For non-book materials the statement takes on a different meaning, such as frames for filmstrips, etc.

12 ILLUSTRATION.

The illustration statement, a non-established element, is entered here as it is to appear in the catalog. In order to describe particular features of the illustrative content for searching and retrieval, three codes are allowed. The appropriate codes should be checked.

I -illustrations
MA -maps
MU -music

It should be noted that any library desiring a more extensive coding scheme can increase the number of description codes allowable for any element by simply adding them on the input control notice and preprinting them on the catalog work sheet.

13 SIZE.

The size of the item being catalogued, as it is to appear in the catalog, is entered here. For non-book materials, the element can take on a different meaning. For example, for phonorecords, the size could represent the number of revolutions per minute - 33, 45 or 78.

14 SERIES.

The series statement as it is to appear in the catalog is entered here. This is an established element; any non-established series should be preceded by the △ symbol which will serve as a signal to the computer program to omit the authority file check. (In general, this symbol is used to signal the computer that non-established data has been entered in an element that is normally established.) If the series is established then the established form should be entered in 15. A new series can be established by checking "N". The △ symbol should be used to separate the established name of the series from any extensive information such as volume number etc.

If the series is to be traced, check "Y", and a series entry will be generated.

If more than one series is to be traced, enter the principal series in 14 according to the above instructions. The other series should be entered as notes in element 15, and again as elements 19 so that they will be traced.

15 NOTES.

All notes, including bibliography as called for in the catalog rules are entered in this non-established element. As noted above, all multiple series will also be entered in the notes element. (Along with complicated imprints).

16 - 19 TRACINGS.

There are four types of tracings that can be entered here and they should be listed in the following order.

16 = all subjects (including names used as subjects)
17 = name added entries (authors, editors, translators, etc.)
18 = title entries (in addition to element 03)
19 = series entries (in addition to element 14)

There may be more than one entry for each of the elements and they should be numbered -1, -2, etc. For example, three subjects to be traced would be numbered 16 -1, 16 -2, 16 -3, in the element number column.

16 SUBJECT

This is an established element and the established form of the subject heading should be entered here. If the subject is one being established "N" should be entered in the description column. Names may be used as subjects, and described with the same codes used for element 01. These codes should be written in the column headed by (description) immediately following the "N". Each code is separated by a comma. Topical subjects will be described with the code TS. Once an item is established, there is no need to enter the description codes since they will be carried on the authority file and supplied when needed. The use of codes is called for only when establishing a new subject.

Filing and printing forms can also be entered in 16 when establishing new subjects.

Element subdivisions can be used with subject headings, as described later.

17 NAME ADDED ENTRY.

This is an established field and only the established form of the name should be entered here. If the name is now being established enter an "N" in the description column immediately following the number 17. Description codes (the same as the codes in element 05) are entered in this column after the N and each code is separated by a comma. Filing and printing forms may be used here, as well as element subdividers.

18 TITLE ADDED ENTRY.

If an item calls for more than one title entry, the principal title is entered in element 05 with a checked "T", and each subsequent title is entered (following the subject and added entries) as an element 18. This is a non-established element and will be used for printing only.

19 SERIES ENTRY

If more than one series is to be traced, the principal series is entered in 14 with a checked "T"; the other series are entered as notes in element 13 and then entered again (in the form for tracing) in elements 19. As in 14, this is an established field and all extra information, such as volume number, should be preceded by the Δ symbol. Any non-established series entered here must be preceded by the Δ symbol, as with element 14.

A series can be established in element 19 by entering "N" in the description column.

20 LANGUAGE. 21 SECOND LANGUAGE

The language elements are established - codes will be entered in elements 20 and 21 - and will be used for searching and retrieval purposes only. Neither the languages nor the codes, are intended for printing in a normal catalog record. However, they can be printed if the proper entries are made on the output control entries.

The code for the principal language is entered in element 20. If a second language is to be designated, its code should be entered in element 21 with one of the following symbols checked:

T - translation; 21 will contain the language in which the work was originally written, or multilingual, as in the case of anthologies.

D - Dictionary; if only 2 languages are used, they will be entered in 20 and 21. If more than 2 languages are used, 20 will contain the principal language and multilingual will be entered in 21.

G - grammar or reader of the type used in language course. The native language will be entered in 20, and the language being studied will be given in 21.

If the item is not a translation, dictionary or grammar, and a second language is used, no code need be entered.

22. PHYSICAL FORM.

The code which best describes the physical form of the item being cataloged should be checked. The following codes are provided on the model catalog worksheet, but may be modified by the user library.

BK = book or pamphlet

BR = broadside

MA = map

MC = microcard (opaque; approx. 3" x 5")

MF = microfiche (transparent; size may vary;)

MM = microfilms (transparent; on reels)

MO = motion picture

MP = microprint (opaque; approx. 6" x 9")

MS = manuscripts

MU = music (scores)

PG = photographs

PH = phonorecord

PT = phonotape

PR = print

TS = typescript

23 BIBLIOGRAPHIC FORM

The code which best describes the bibliographic form of the item being cataloged is entered here. The following codes are provided on the catalog worksheet:

AN - analytic
DD - doctoral dissertation
GP - government publication
PB - picture book
SE - serial
TB - trade book
TX - textbook

These codes are only samples of what might be necessary for coding bibliographic form. The library might decide that it is unnecessary to use all these codes, and limit the choice to monograph, serial and government publication.

24 BIBLIOGRAPHY INDICATOR

If the item contains a bibliography, an "Y" is entered in element 24. Otherwise it is left blank.

It should be noted that any library desiring to code different forms of bibliography can do so by printing the codes in element 24 of the worksheet and providing the information to the input control section.

25 COLLECTION CODE

The codes entered here will be symbols standing for various locations in a library or system, or for significant collections in the nature of gifts, bibliographic entities, etc. Each library or system will list its own set of collection codes to be entered here.

All collection codes are established and are all entered in one element separated by the A symbol. The output control section will inform the computer system if and where the codes are to print in the catalog entry.

The General Catalog Worksheet

The first three portions of the model catalog worksheet are required by the computer system. These are:

The Worksheet Identification CW
The Change Type N, C, or D
The Item Number

On any worksheet used with this system these three portions must be used exactly as described for the model catalog worksheet. The remainder of the catalog worksheet consists of a sequence of elements. There may be any number of them in any order. Thus, once the rules which govern the structure of an element of the catalog worksheet are given the rules governing the structure of the entire worksheet are known.

The central feature of the input design is the fact that to the computer programs all elements are alike. The input edit program is designed to read from paper tape, edit, and transcribe to a high speed file (magnetic tape or random access storage) the catalog worksheet elements. One program will accomplish the edit and transcription for all elements, whether it is the notes statement or the short coded physical form element. In other words, there will not be a separate program for each element; a general purpose input routine, under direction of the input control matrix, will edit and transcribe each element.

The input control matrix, describing each element, will be coded by the library just once and will be held in the computer system. The instructions for coding the input control matrix, the various possible codes, and the relation of the input control matrix to the standard element of the catalog worksheet are given in a later section.

The general element of the catalog worksheet will now be described. It will be seen that all of the elements of the model catalog worksheet can be constructed by selecting the proper options provided for the general element. It will also become evident that a very wide range of catalog data requirements can be met by options available for use with the general element.

The general element is made up of four parts:

1. The element divider, △, a special symbol is punched by the typist before each new element. This symbol is necessary for machine recognition of the start of a new element. The △ symbol need not be pre-printed on the catalog worksheet; instructions for automatically punching this code should be included in the instructions to the typist.

2. The element number, a unique identifier, follows the element divider. Each distinct piece of data, such as author, title, etc. is entered into a separately numbered element. There may be more than one element of the same type as in the case of subjects, multiple entries, etc., and each multiple element will bear the same number as a prefix, followed by a dash and unique number. For example, if there were three subject entries and the element number for subject were 18, then the three entries would be numbered 18-1, 18-2, 18-3. The model catalog worksheet allows 23 different elements, to be numbered consecutively from 01 to 23. However, the system allows either two numerics or one alpha character to be used as element numbers. A library might decide, for example, to mnemonically code certain elements - A for author, S for subject, etc., or might not want the elements to be consecutively numbered. The element numbers, one alpha or two numeric, and their order of appearance on the catalog worksheet are completely arbitrary, as long as they are properly described on the input control section.

There are two more possible variations to the form of the element number.

2a. There may be certain elements (such as bibliographic form in the model catalog worksheet) which are of fixed length, and contain one or two character codes only. Keypunching time would be saved if an element divider and number did not have to be typed before each of these elements. The typist would record the codes for all the fixed length elements in a prescribed order on the worksheet, without any dividers or numbers before the elements. The input control section would carry the indication that the corresponding elements are not divided, and would define the length of each element. The computer program would use this information to divide the elements and insert the appropriate tags.

If, for example, a worksheet were designed where elements 20 and 21 were 3 character codes, 22 was a one-character coded element, and 23 and 24 were 2 characters, then the input control section would be coded in the following way:

20 (3,[illegible])

21 (3,[illegible])

22 (1,[illegible])

23 (2,[illegible])

24 (2,[illegible])

B. Certain elements of the worksheet are used with almost every item cataloged. If these elements are punched consecutively, and consecutive element numbers are used for these elements, then it is not necessary for the element numbers to be keypunched. The computer can automatically assign consecutive element numbers. Each element must be preceded by an element divider. If any of the elements is not used in cataloging an item, then an extra element divider must be punched. This signals the computer to skip one number in the element number assignment.

If this option is used, all of the elements keypunched in this way must be at the beginning of the worksheet, and the first of these elements must have the number 01. The input control section will be coded so to indicate that this option is being used and to show the number of elements at the beginning of the worksheet that are treated in this way.

C. Immediately following the element number, or following the element mark if the element number is not explicitly keypunched, are any special codes used with the element. These codes are surrounded by angle brackets : ‹codes›. The presence of the angle brackets tells the computer system that codes have been entered. If codes are not used, the angle brackets need not be present. The codes are of variable length. They are alphabetic, numeric, or a combination. If several codes are entered, they are separated by commas.

Two kinds of codes are usable. Indicator codes signal the computer that some type of processing action is to take place in connection with the element. Descriptive codes give some characteristics of the element. Four indicator codes are specified : "A" for "add", "D" for "delete", "E" for "do not index", "S" for "main entry". Special programming would be required to provide additional indicator codes. There is no limit to the number and kind of descriptive codes (except that the letters A, D, E and S cannot be used for descriptive codes since they are used for indicator codes).

The indicator code "E" is used only in connection with established elements. If an element has been designated in the input control section as an established element, and if a new form is to be used in this element in connection with the cataloging of an item, then two options are available for the establishment of this form:

The indicator code "N" is used only in connection with established elements. If an element has been designated by the input control notice as an established element, and if a new form is to be used in this element in connection with the cataloging of an item, then two options are available for the establishment of this form.

An authority file worksheet (described below) can be entered to establish this form, or the form can be entered on the catalog worksheet along with the indicator code "N". If the latter option is taken, the computer system will accept the form as valid and will enter it into the computer authority file.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [illegible]

[illegible] [illegible]

[illegible] [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

c) Any information between these marks /\ will be replaced by the information entered in the Filing Form field at the end of the statement.

[illegible], [illegible], [illegible]- ed. [in Russian]
[illegible]
Filing as : [illegible]

[illegible], [illegible], [illegible]-
[illegible]
Filing as : [illegible]

O'Brien, Michael Joseph, [illegible]-
[illegible] of Old Virginia. [illegible]
Filing as : [illegible] OF OLD VIRGINIA

Sheridan, Richard Brinsley Butler, 1751-1816.
St. Patrick's day. [illegible]
Filing as : SAINT PATRICK'S DAY

O'Brien, [illegible]
[illegible]
Filing as : [illegible]

[illegible], [illegible], [illegible]-
[illegible] and the seven seas. [illegible]
Filing as : [illegible] AND THE SEVEN SEAS

d) The entire statement will be replaced by the information entered in the Filing Form field when the symbol is used as the first character in the Filing Form field. (No symbols are used in the body of the statement.)

Perkins, William, 1558-1602.
The Works Of That Famous and Worthy Minister Of Christ in the Universities of Cambridge. (Works of that famous and worthy minister of Christ in the Universities of Cambridge)
Filing as : WORKS OF THAT FAMOUS AND WORTHY MINISTER OF CHRIST IN THE UNIVERSITIES OF CAMBRIDGE

The filing form will be followed, when necessary, by the printing form which is also enclosed in brackets - ⟨printing form⟩ . A printing form is necessary if an element is being established on the work sheet, and a code is to be used for the established form. The printing form must then be entered on the work sheet and the computer will enter the printing form on the authority file along with the established form. It may be necessary to write a printing form in cases where the title page of the item being cataloged does not contain the information in the way the library wishes to record it. In this case the printing form will contain [ ] brackets to indicate that these words were not derived from the title page.

The printing form will follow the filing form and will be recognized by the computer as the second field with ⟨ ⟩ brackets. If only one bracketed part is present, the computer will distinguish the filing form from the printing by the presence or absence of the ↓ symbol in the statement field or in the brackets. If no ↓ symbol is present then the bracketed words are the printing form.

The Use of Special Symbols

This section summarizes the rules for the use of special delimiters and control symbols on a catalog worksheet designed for use in the computer catalog maintenance system.

Normal Delimiters

There are two delimiters which are used in normal circumstances to mark off portions of an element. These are:

△ = Major delimiter
‖ = Minor delimiter

If major divisions of the element have been set up by means of the △ symbol, then subdivision within a major division can be carried out with the ‖ symbol. However, in addition to this logical distinction, there is a functional distinction in the use of the symbols in the computer system. Delimitation of a sub-element by means of the △ symbol allows the use of certain built-in features of the computer system on that sub-element; that is, if a portion of an element has been marked off with a △ symbol, then:

1. That portion of the element can be checked against the machine authority file independent of other portions of the element;

2. By appropriate indication on the output control card, that portion of the element can be printed separately;

3. By appropriate indication on the output control card, that portion of the element can be excluded from the information that governs the sorting sequence of entries, or can be included in the sorting sequence in any position.

Since the ‡ is not recognized in any of these automatic functions, it would be necessary to do special programming in order to actually use information that has been marked off with a ‡ . This would take the form of a separate program or a special routine entered into the general purpose computer system. The principal anticipated uses of the ‡ symbol are:

1. To mark off portions of an established form which a specially prepared filing routine will have to recognize;

2. To mark off portions of an established form in anticipation of the use of a special program to carry out special searches on those portions;

3. To mark off portions of an established form in anticipation of the use of a special routine to vary the typography of those portions.

For an established element, the △ symbol always marks the end of the established portion of the element. Thus, if parts of an established form are to be delimited, the ‡ symbol must be used.

There are four reasons for which a delimiter might be used with an element. These are:

1. To allow printing of a portion of an element separately from other portions of the element, or to allow printing in a different type face;

2. To separately identify a portion of an element for purposes related to establishing the correct sequence of entries;

3. To allow extraction of that portion of an element which is the established form of a name, subject or other concept, and to separate it from other material which is not part of the established form;

4. To allow special searches on portions of an element.

Note that, as stated above, when the △ delimiter is used, there are built-in system provisions for accomplishing purposes 1, 2 and 3. There is no system provision for purpose 4, even when the △ symbol is used. The system is designed for the maintenance of a machine form catalog and the production of printed outputs; it is not designed for machine searching.

The purposes accomplished by means of the delimiters could be accomplished by defining each of the delimited portions of an element as a separate element. However, this can be awkward in some cases, particularly if the number of such separate sub-elements is not predictable. The use of a delimiter is found convenient in the case of names, titles, series and subjects.

If the name is given along with the relationship to the work, such as, editor or translator, then a major delimiter can be used to separate the name from the designation of relationship. Since the major delimiter terminates the established form for machine purposes, the designations, such as translator or editor, will not be included in the match against the authority file, and this is what is desired. Within the name it may be desirable to delimit for possible future refinements in typography, possible special searches, or possible special programming to be included in a filing rules program. If this is to be done, then the [illegible] symbol should be used to delimit each portion of the name. For instance, current planning at the Library of Congress is to include delimiters that would mark off the following portions of a name: name, honorary title, date or other qualifier.

Within a title it may be useful to delimit these portions:

1. The short title;
2. The complete title; and
3. The title extension.

The [illegible] delimiter should be used for these divisions. This will allow completely automatic system control on any of these portions. Since frequently the short title and the complete title are the same thing, the second of these sub-elements will often not be present, and it will be necessary to insert an extra delimiter to mark the absence of this sub-element. Because of this, it would probably be more convenient to set up the title as two elements. The first would be the title proper, with a delimiter to mark the end of the short title if there is a short title. The second would be the title extension established as a separate element.

The established series name is often followed by a qualifier such as the number of the series. A [illegible] symbol delimiter can be used between these portions.

With subjects the use of delimiters to mark the subject heading into main heading and sub-heading portions can be useful. Whereas, it is doubtful that this would be used for typographic purposes, it may be useful for sorting, for special searching, and to allow certain sub-headings to be established independently of the main heading. Generally, if the sub-heading portions of a subject heading are to be marked off, the [illegible] delimiter should be used. This is necessary since the presence of the [illegible] symbol marks the end of an established form.

However, there are certain cases in which it would be valuable to use the [illegible] for the substitution. This is in the case of what has been termed in the computer specifications "universal sub-headings."[1] These are sub-headings which have wide applicability in combination with many major headings and it is desirable to be able to establish them once and to use them in combination without establishing each combination. Such headings would be form subdivisions and perhaps geographical subdivisions. In these cases, the subheadings should be preceded by the [illegible] delimiter.

The principal use of the [illegible] delimiter will probably be in connection with the delimitation within established forms. Note that in this case it is not necessary to write the [illegible] symbol on the catalog worksheet if the form has already been established. The [illegible] symbols will have been entered at the time of establishment. They will be carried in the machine master files. They need not be used afterward on input worksheets. Thus, the [illegible] symbol in such cases would only be used on the authority file worksheet, or if the establishment of new forms from the catalog worksheet is permitted, they would be used the first time that a new form is used on the catalog worksheet.

Exception Delimiter [illegible]

The input control notice contains information which tells the computer which elements are established and which are not established, and which also can tell the computer which portions of an element are established or not established in the case where the [illegible] delimiter is used to divide an element into sub-elements. Occasional exceptions to the definition of established or non-established elements or sub-elements can occur. To accommodate these, the exception delimiter, the [illegible] is used.

The [illegible] delimiter preceding an element or sub-element indicates that the normal definition of its established or non-established status given on the input control notice is to be reversed.

One use of this would occur in connection with libraries which catalog individual articles and journals. In some cases the practice is to use these under subject headings only, and not to make an author entry. In this case the information appearing in the main entry element does not generate an entry and the name is not established. Such a main entry element would be preceded by the [illegible].

Another instance would occur in connection with subject headings where it might be desired to include a non-established specifier as a sub-heading to an established sub-heading. The input control notice would have indicated that normally all portions of a subject heading are established. In this exceptional case, the non-established sub-heading would be preceded by a [illegible].

Making Changes To The Catalog Entry

To change an existing catalog entry, the catalog work sheet will be used with a "C" (for change) inserted in the top line following the identification "CAT". The cataloger will enter the item number and any changes to the corresponding element. Except for changes to the codes (enclosed in parenthesis) the complete element must be rewritten in order to change any field within the element. The computer program will replace the element with the new information. Other elements will not be affected.

For example, to change the filing form of a title, the whole element should be rewritten:

original entry: 40 [illegible] [illegible] and the [illegible] [illegible]
[illegible] will file under [illegible] a new filing form is inserted:

changed entry: 40 [illegible] [illegible] and the [illegible] [illegible]

The computer will replace the original element 40 with the changed element. The remaining elements will not be affected.

In order to delete an element, the same procedure is used. The correct item number is entered in the appropriate position on the catalog work sheet (type C), and the delete symbol # is inserted following the element number to be deleted.

original entry: 17-5 [illegible] [illegible], [illegible], [illegible].

deleted entry: 17-5 #

In this case the library has decided that it does not want to trace [illegible] as the second added entry. The # symbol entered in element 17-5 on the catalog worksheet will cause the removal of [illegible] [illegible] [illegible] [illegible] [illegible].

In order to change a code only, the whole element need not be rewritten. The new code should be entered within the brackets and the rest of the element is left blank. The computer will retain the information contained in the element and insert the new code:

original entry: 40 [illegible] [illegible] [illegible]

changed entry: 40 [illegible]
[illegible] in 40 will [illegible] the title entry.

The Input Control Notice

The input control notice (Fig. 7) is coded for each element in order to describe to the input edit programs certain characteristics of the catalog record that are subject to variation depending on the worksheet design.

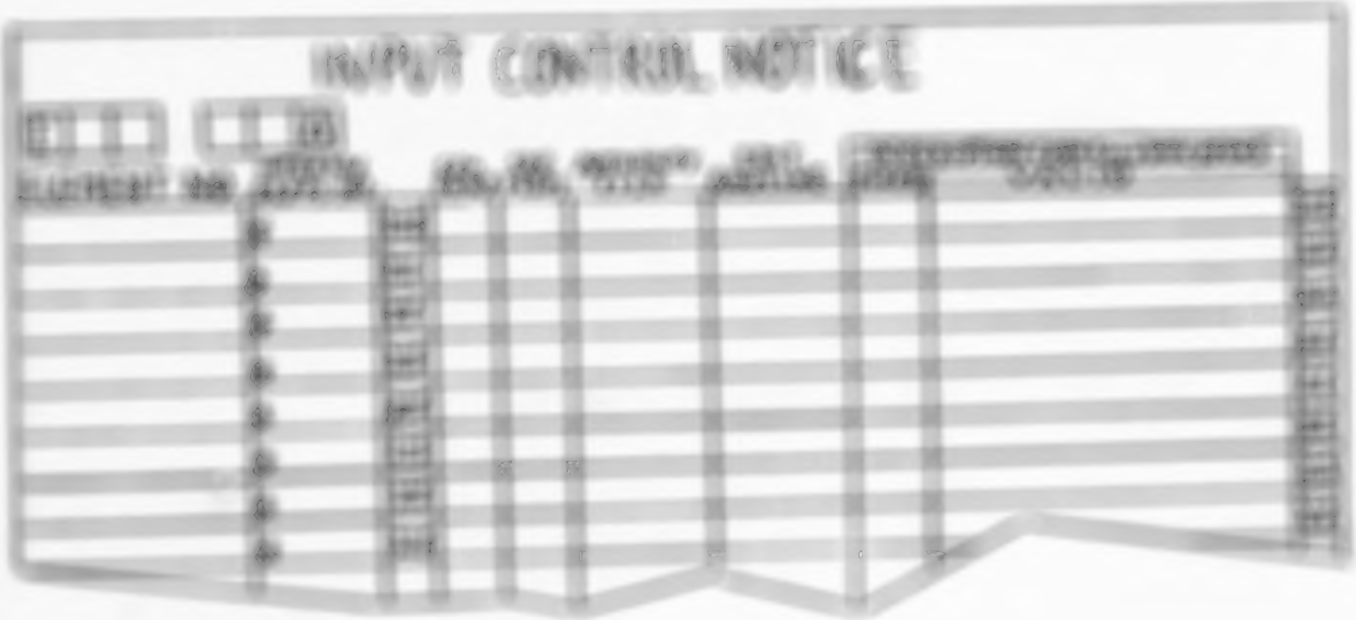


FIG. 7

Preprinted in the top left is an I which identifies this form as an input control notice. The spaces are provided for numbering this particular control notice to differentiate it from other input notices that may have been coded for the system.

As noted above, [illegible]

[illegible]

[illegible]

[illegible]

1. [illegible]

2. [illegible]

3. [illegible]

   Example 1: [illegible]

   Example 2: [illegible]

4. [illegible]

[illegible]

5. [illegible]

6. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

THE AUTHORITY FILE MANAGEMENT

The meaning of the term "Authority File" as used here is extended beyond the usual meaning in library work. Any element which must be written in one of a number of predefined forms given in a list is called "established". The list of established forms will be called an "Authority File". Thus, the "language" element of the model catalog worksheet is an established element. The list of established language codes maintained by the machine will be called a language code authority file.

The authority files are also used for other purposes than the recording and checking of established forms. The authority file procedure for the computer allows a code to be assigned to each established form. The code can be used in cataloging and the computer will substitute the fully expanded form in all printed output. The use of such codes in an element such as the language element is not uncommon. Thus, the cataloger might write FR as the language code, and the computer will supply "French" in the printed output. However, the system also allows the use of codes with subject and name headings. This makes available the interesting possibility of assigning codes to the subject and name authority files. The cataloger could pick up the code when he [illegible] the authority file listing and could use the code on the catalog worksheet.

The authority file is also used to supply a filing form for established forms and to create description codes for established forms.

The authority files will be maintained in the computer. The main authority file will contain established subjects and names — personal and corporate, and established forms for all subheadings that may be used in combination with any main heading — the universal subheadings. The auxiliary authority file is intended for use with elements which are never used as headings for catalog entries, but have been assigned established forms or codes; for example, language, physical form, collection code, etc.

The authority file worksheet is used for both the main and auxiliary authority files to establish new authority, make changes to existing entries, and delete completely from the files.

The following forms will be established on the main authority file:

anonymous classics
conventional titles
corporate names
personal names
series
subjects
uniform headings
universal subheadings

The following forms will be established on the auxiliary authority file:

bibliographic form
collection code
language code
physical form

As described above, new authority can also be established using a catalog worksheet. However, this is true only for a main authority file. A universal subheading or an auxiliary authority file entry must be established with an authority worksheet. The use of the catalog worksheet for establishing new main headings is also limited to the case where the authority entry does not call for any notes, public or cataloger, and it does not carry any cross-references-see or see also. In the event that there is a need for notes or cross-references, an authority worksheet must be completed.

Fig. 4 is a sample authority file worksheet.

AUTHORITY FILE WORKSHEET

FOR CORRECTIONS ONLY

N
C
D

File No.
2.

	1	2	3
	No Proposed	Revised Heading	No Heading

gf

ESTABLISHED FORM

1. FILING FORM

2. CODE

3. DESCRIPTIVE TERMS

4. CATALOGUER NOTE

5. PUBLIC NOTE

CROSS REFERENCES: See, See Also, See From, See Also From

S-SA-SF-SAF	Cross Reference Identification

FIG. 6

[illegible]

AF will be preprinted in the top left and identifies this input as an authority file worksheet.

If a new entry is being established, "N" is entered in the space following AF. If an existing entry is being changed, "C" is entered in this space. To delete any entry completely from the authority file, "D" is entered in this position.

The next position is used to identify the type of authority file entry. If the worksheet is establishing an entry in the main authority file that may be used as a universal subheading, then an "S" is entered in this position. If the universal subheading is to be separated from the main heading by a comma, then a comma must be written following the "S". If a dash is to separate the headings, the "S" alone should be written. The program will automatically insert the dash in place of the symbol which is written on the catalog worksheet.

If an entry in the auxiliary authority file is being established, then a file number must be inserted in this position. This file number will inform the program which auxiliary file to search in order to match on the authority file.

For instance, for the model catalog worksheet, the following file numbers could be used:

language code	01
physical form	02
bibliographic format	03
collection code	04

The next 2 boxes, top row to the right, are to be used only for certain universal subheadings, when it is desired to override the rules set down in the output control record.

1. In some cases it may be desirable to establish a universal subheading which will not affect the filing sequence of the heading-subheading combination; filing will be based on the main heading only. In this case a "Y" is entered in the box labeled NO SEQUENCE.

For example, a library might establish certain designations (qualifiers) such as tr. for translator, ed. for editor, etc. (these are not true subheadings, but are established with the same mechanism), and would want these designations printed in the headings, but would not desire to group all translator added entries together, all editor added entries together, etc.; a Y entered in the first box would accomplish this. The designation would print in the entry, but would not affect the filing.

(Note: Additional means of controlling the effect of universal subheadings on sequence will be described in the discussion of the scope control section.)

4. For book catalogs, the general rule will apply (that) in that each one heading-subheading combination will print before its entries. However, the library might decide for a particular subheading to appear only the universal subheading. In this case a "P" is entered in the box labelled PARTIAL HEADING.

For example, geographical universal subheadings might be treated in this fashion; only the geographical subdivisions would print instead of the whole heading-subheading combination.

EDUCATION

- FRANCE (followed by entries)
- GERMANY " " "
- SPAIN " " "
  etc.

5. For certain subdivisions or qualifiers the library might decide that no heading should print at all. In this case an "N" is entered in the box labelled NO HEADING. The example cited in number 4 above - the use of designations such as translation, edition, etc., might apply here. A library might decide to use these designations [illegible] perhaps, grouping), yet not desire to have any part of the heading print as a break in sequence. All entries for the particular main heading would be printed in designated sequence without any repetition of the heading or subheading.

If the subheading is not to be included in the sequence (X), then it is obvious that it should not be printed as a heading. The program will automatically assume that all non-sequenced subheadings will not print. However, there may be sub-headings that will not print (N), but which be included in the sequencing of an entry. This information will be carried on the authority file and supplied to the programs that produce the catalog entry headings. Sequencing and heading printing will be suppressed for the cases in which the respective boxes have been filled in.

To complete the authority file worksheet, the cataloger will enter the established form and appropriate information in elements 1 to 5. Not all elements will be present for all authority entries. If an element does not apply to a particular authority entry, it is simply left blank. After the five elements, the cataloger will enter any see, see also, see from, or see also from references in the prescribed positions.

[illegible] [illegible]

[illegible]

[illegible] = [illegible]
[illegible] = [illegible]
[illegible] = [illegible]
[illegible] = [illegible]
[illegible] = [illegible]
[illegible] = [illegible]
[illegible] = [illegible]
[illegible] = [illegible]

[illegible]

[illegible] = [illegible]
[illegible] = [illegible]

[illegible] consideration, one might assign:

[illegible] = Used as subject heading.
[illegible] = Used as name main or added entry.

[illegible]

1. [illegible]

[illegible]

2. [illegible]

This form will appear in both the Authority File listing and in the public catalog.

[illegible]

[illegible]

[illegible]

For example, in order to establish the following SEE reference:

Society of Rosicrucians, Inc. SEE Ancient Rosicrucians of America.

the cataloger makes the following entries on the Authority File Worksheet:

Established form: Society of Rosicrucians, Inc.
Description code: 9
Cross references: X Ancient Rosicrucians of America.

Note that under Description code, 9 stands for Society or institution; under Cross references, X stands for SEE reference.

The above example assumes that when Ancient Rosicrucians of America was first established, no SEE FROM reference was made for Society of Rosicrucians, Inc. Had the SEE FROM reference been originally made, it would have caused the automatic generation of the SEE reference illustrated above.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]
[illegible]

[illegible]

[illegible]

[illegible]
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

PROCESSING STEPS

EF

ESTABLISHED FORM

1

CHANGE TO

2

FIG. 9

Preprinted in the top left are the letters "EF" which identify this input as a change in the established form. In element 1, the cataloger enters the established form that is to be changed. The new form is then entered in element 2.

The new form must have already been established or must now be established on a separate authority file worksheet. If the new form is not found on the authority file, the EF input will be rejected as an error.

Effect of Changes and Deletions

The change or deletion in the authority file itself can be accomplished by the machine system with no great difficulty. However, the problem of making (logically) coherent changes in entries (which have already been made under the heading) that are affected by the change or deletion is an extremely complex one. The simplest solution is to make no automatic changes to entries, but instead to leave the library staff to decide what should be the effect on entries of changes in the authority file, and to initiate the appropriate entry changes. This is quite similar to what must be done under present methods. It should be slightly better under the machine system since entry changes should be easier to execute under the machine system than under present methods.

It would, however, be unfortunate if it were necessary to take this approach. A great advantage that may be achievable through use of the machine system is to be able to reorganize catalog files without the great difficulty and labor which this involves today. The key to this is the automatic adjustment of entries as a result of changes in the authority file. Consequently a rather complete system of automatic generation of entry changes is specified here.

It should be noted that three files are involved - the main authority file which contains headings only, and is in sequence by the identification (established form or code); the catalog file which contains headings and entries and is in sequence by filing form; and the auxiliary authority file which is in sequence by the established codes. A change in any authority entry will not only affect the authority files involved, but will result in changes in the catalog files as well.

1. Any changes to the print or filing form, description codes, cataloger or public notes in the authority file will be carried over to the appropriate heading record in the catalog file.

2. The cataloger or public notes, and the cross reference information will never be used in the body of a catalog entry. However, the established form and description codes may have been carried onto the body of the entry. If so, any changes to be made will affect all entries following the heading on the authority file. If information from any of these elements had been carried over into any other entry in the catalog, then a change will be generated in the other entries as well.

3. If a change is made to the filing form, then the heading record and all entries that follow will be removed from the catalog file and refiled in a new position.

4. If a change is made to the established form then all entries that were filed under the old heading will be refiled in accordance with the new information.

5. When a change is made to a see, see also, see from, or see also from reference, the change will affect the authority file and the catalog file; and, in addition, see from, see also from, see, and see also references will be generated at the referenced points in the authority file.

6. If a see reference is entered for a heading where none had existed before, all entries that had previously been under the heading will be removed and transferred to the newly referenced heading.

7. If a heading is deleted, every entry under that heading will be processed as if a catalog worksheet change had been entered which contained a deletion of the element that caused the generation of the heading. In other words, the catalog files will be searched and every mention of the heading, either in tracings or in a heading, will be removed from the files.

SPECIAL REQUEST NOTICE

There may be cases when the Library will require a change in the procedures associated with the printing of catalog card proof copy, or the inclusion of error free catalog entries in the catalog. Fig. 6 is a sample special request notice which will be used to enter requests for a change in procedure.

SPECIAL REQUEST NOTICE

SR ITEM NUMBER
1) PRINT CARDS ☐
2) PRINT PROOF COPY ☐
3) ENTER NOW ☐
4) HOLD UNTIL ☐

FIG. 6

The notice is identified by the letters "SR" in the top left corner. Following this the item number is written in. A request for the printing of catalog cards for an item already cataloged is accomplished by inserting a check in element 1. If the cataloger requests an extra proof copy and error diagnostic, a check is inserted in element 2.

There may be cases when the library requires that a particular entry be included in the catalog immediately without the automatic delay. As described below in the discussion of procedures, there will be an automatic delay between the printing of proof copy and the inclusion of the entry into the computer files. In other words, after proof copy has been delivered by the computer, the computer will wait a preset time period (to be decided by the library), and if no corrections are received, will assume that it may now be put in the error-free files. If a library requires, because of the printing schedule or any other reason, that a particular entry be immediately included in the files, then element 3 of the SR notice should be checked.

In case the library desires to delay automatic inclusion into the computer files, element 4 of the SR notice is checked. If a specific date for inclusion is known it is entered on the SR notice immediately following the check in standard date form - MO/DA/YR. If no date is entered, the computer will delay inclusion into the files until an SR notice to enter now is completed. All held entries - catalog and authority - will be listed on the error reminder notice.

NEW TITLE NOTICE

Though the new title notice, if used, is the first input for any item acquired by a library, the description of this input has been presented last since the computer maintained cataloging system is complete without the new title notice, as long as all cataloging is original, and no acquisition system is linked to the cataloging process.

However, one of the major savings in the proposed system is the automatic inclusion of machine - readable catalog copy forwarded by the Library of Congress. The system is designed to accept this information and print it on worksheets for cataloger review and inclusion into the catalog files. Secondly, it is inevitable that once automatic procedures are instituted for cataloging, acquisitions and administrative functions will also be included in the automated system (because of this many facets of the system have been designed in a general fashion to allow for the additons and changes that will eventually be incorporated into the system). The new title notice will be used to extract LC data and acquisitions information from the master files, whenever this data will be helpful to the cataloger.

During the first stages of implementation, before LC copy has been included in the system, the cataloger will enter all cataloging information on the catalog worksheets as described above. Once the system has grown and is receiving and storing LC machine - readable catalog information, the new title notice should be used first. If the LC card number is available, that is all that need be entered. The computer will search the files for the matching LC card number and print the LC copy on a proof copy worksheet. The cataloger will review the LC copy and make any changes that may be necessary. Only the changes will be rekeyboarded. If the LC number is not available, then the new title notice should contain the data necessary to successfully search the LC files alphabetically. This has not yet been determined, but it will probably be necessary to enter author, title, publisher, edition, and date. The computer will search the files for this item, and if it is found, the proof copy worksheet will be printed. If the LC copy is not found in the files, then the printed worksheet will contain the information originally submitted on the new title notice - author, title, etc.

For the cataloging system only, the function of the new title notice is to initiate a computer search for LC copy. However, once the acquisition system has been automated the new title notice plays a more important role. For items ordered from vendors, the entry of the order into the system serves as the new title notice, and when the item is received at the library and a notice of receipt is entered into the system, the search is made, and a proof copy worksheet is printed by the computer. For items received as gifts or automatic on-approvals, a new title notice is entered upon receipt of the item at the library, and the computer will search the files and print a proof copy worksheet. It will also be used in the acquisition system to generate process control worksheets for receiving, accounting, and shipping, and create an entry in the computer files so that ordering, billing and related procedures can be carried out before cataloging is complete.

II OUTPUT

The following outputs will be produced:

1. book catalogs
2. catalog cards
3. catalog proof copy
4. error listings
5. error reminder notices
6. authority file
7. authority file audit listing

The basic output of the system is the catalog. Because of the differences between book form and card catalogs, they will be described below separately. For both book and card catalogs the output control notice will provide information to the programs that will define the content and format of the various entries. For book catalogs, it will also control the sequencing within either a dictionary form or divided catalog.

For every catalog worksheet entered, proof copy and error listings will be prepared. These will be checked by catalogers (or revisors, as the case may be). Periodically, all errors that have not been corrected by the staff will be printed on an error reminder notice. The combination of proof copy, error listings, and error reminder notices should serve not only as a rigid control for catalog entries, but should also speed up the error correcting procedures.

Periodically, cumulative authority file listings, main and supplement, will be printed for staff use. In order to control the updating of the authority files, an audit listing will also be produced. This will show all changes made to the authority file since the last printing - what the entry contained before the change and what it contains now, and any errors noted by the computer. It should be noted that all computer listings will be dated.

Each of the outputs will be fully described below.

THE BOOK CATALOG

Many variations in content, organization, and appearance of the book catalog are possible by the use of the control records. The catalog printing will be described by defining a model catalog and then presenting variations from the model with are possible. In defining the model catalog, input submitted using the previously presented model catalog worksheet will be assumed. A comprehensive description of all possible variations will not be presented. In order to obtain a complete understanding of the possible variations, the discussion of the use the control notices must be examined. The Model Catalog will be a dictionary catalog. Most of the basic description and the variations thereon apply equally well to a divided catalog. However, there are certain features peculiar to a divided catalog and these will be discussed separately in the last portion of this section on the book catalog.

The Conditions for the Occurrence of Catalog Components

The Catalog Components

The catalog is made up of the following components:

entries
headings
public notes
see references
see also references

Entries

One catalog entry is printed for every subject entry and added entry listed on the catalog worksheet (elements 16 and 17) and for the main entry statement (element 03) if anything is present there. An entry is printed for the title (element 05) if "M" or "T" had been checked on the worksheet in 05. An entry is printed for the series statement (element 14) if "T" had been checked in 14. Additional title and series entries are printed if element numbers 18 or 19 had been entered on the catalog worksheet.

Variations: Entry printing is determined by the input control notice. Variations in the conditions for generating entries may be made as described in the section on the general structure of the catalog worksheet.

Headings

One heading appears in the catalog for each of the following:

1. Each title entry.
2. Each series title for which there are entries.
3. Each subject for which there are entries.
4. Each name for which there are added entries, or main entries without conventional title.
5. Each name-conventional title combination for which there are main entries.

Note that statements 3 and 4 above imply that if a name is used as a subject and also as a main or added entry, then separate headings will appear for the use as subject and for the use as main or added entry. This is correct for the model catalog, since in this catalog it is intended that when John Jones appears as both subject and main or added entry, the heading preceding all main and added entries will be "Jones, John", while the heading preceding all subject entries will be "Jones, John - works about". (By proper use of the output control, the heading followed by "works about" can be eliminated).

If a subject is written as a main heading combined with sub-headings, then the entire combination is considered the heading and will print in the catalog.

If a main or added entry is followed by one of the qualifiers tr., ed., etc. for translator, editor, etc., these are not regarded as subheadings and do not cause printing of separate headings. For titles and series, although the title extension and series extension are separated by the Δ mark, these extensions do not cause the printing of headings.

A heading also appears in the catalog for any established heading for which a "see"or"see also" reference has been entered, provided that there are entries or "see also" references under the reference heading. Both here and in the statements above, presence of entries, when printing a supplement, means presence in that supplement. Presence of entries in the main catalog but not the supplement will not cause printing of headings in the supplement.

Variations: The printing of headings is linked to the sequence of the catalog entries. In general, the rule is that a heading can be printed at any change in the printing form of the elements which control the sequence of the catalog entries. Whether or not a heading shall actually be printed at such a change point is controlled by the output control notice. On this notice all of the elements which determine sequence are listed, and opposite each element, a code is given that states whether or not a heading shall be printed at a change in the printing form of that element. Further control is possible by means of the authority file. It is possible to mark a subheading on the authority file so that it becomes a qualifying statement only and does not affect the printing of headings.

It is by this means that the printing of headings for tr., ed., etc. is suppressed. If it were desired to sequence the entries by these subheadings, and print headings for them, this could be done by changing the coding for these established sub-headings on the authority file.

In a catalog that includes a great deal of non-book material, the entries can be sequenced by type of material and headings can be printed for each type of material. In general, headings can be printed at each change in subgrouping under a main heading, whatever the subgrouping may be. For example, it would be possible to specify the printing of a subheading (such as "no.1", "no.2", etc.) preceding each series entry under an established series.

Public Notes and See References

A public note or "see" reference is always printed if the heading to which it corresponds is printed. No variation is possible in this. (Note that a condition previously given for printing a heading with a "see" reference is that there be entries or "see also" references under the referenced heading.)

See Also References

A "see also" reference prints if the heading to which it corresponds is printed and if there are entries under the referenced heading. (For the supplement, there must be entries under the referenced heading in the supplement.) No variation is possible in this.

The Sequence of the Catalog

General

All filing is word by word in strict alphabetic sequence according to the filing form of the elements involved. If an explicit filing form has been provided, either on the authority file or on the catalog worksheet, the filing form is the explicit filing form. If no explicit filing form is obtained as a result of operation of the programmed filing routine upon the printing form.

The programmed filing rules will not be defined in these specifications. They are the object of a special investigation, and the results of this investigation will determine the filing rules to be programmed. It should be possible to write the filing rules routine as a self contained subroutine which can be inserted into any major programs which require it.

By strict alphabetic sequence is meant the normal sequence of the letters of the alphabet and the normal sequence of the numerals. The filing relation between letters and numerals will be established as a result of the filing rules investigation. The inclusion or exclusion of special characters for filing purposes will also be established in the filing rules investigation. Also, if special characters are included, their place in the filing sequence with respect to numerals and letters will be decided.

For an established element, the filing is based upon the filing form or established form in the authority file. For a non-established element the filing is based upon the filing or printing form on the catalog worksheet. For an element that is divided by means of Δ symbols, the filing form for each part is determined by the authority file or catalog worksheet. If an established designation has been marked in the authority file as non-sequencing, then filing takes place as though the designation were not present.

An element that is subdivided by means of the Δ symbols will be compared with other elements on a subelement by subelement basis; i.e. the first subelements will be compared. If they are equal, the second subelements will be compared, and so forth. If one element has fewer subelements than another, and both elements match on all of these subelements, then the one with fewer subelements precedes.

Entries

The major sequence of entries is determined by the information written in the element that generates the entry. (Subject, title, etc.) The sequence within the major sequence depends on the form of entry (i.e., the type of element that generated the entry) as follows:

main entry: conventional title, title, title extension, date of publication.
added entry: conventional title, title, title extension, date of publication.
subject entry: main entry, title, title extension, date of publication.
title entries (main): title extension, date of publication.
title entries (added): main entry, title, title extension, date of publication.
series entries: series extension, main entry, title, title extension, date of publication.

Subject entries will follow any main or added entries under the same heading. No sequence rules are needed for series or title entries mixed with other entries under the same heading, since these entries cannot be made under name or subject headings, and a title or series title used as a subject must be established separately from its use as the title of a work or series.

However, there is the possibility that two different forms of entry, such as title and subject, might have the same printing and filing forms. To resolve the indeterminacy here, the following rule is established: If a name, topical subject, title, and series title all have the same filing form, they will be filed in the order just stated.

Variations: The output control record permits the subsequence under the main heading to be controlled by any stated combination of catalog worksheet elements, and the combination can be stated differently for each type of entry. The order in which different types of entry with the same filing form are filed can also be set arbitrarily. A subgrouping by type of material can be obtained by including physical form or bibliographic form in the filing sequence or by divising universal subheading codes which can be appended to the main heading.

Headings

Each heading precedes the group of entries to which it applies. Thus the filing of headings follows the filing of entries. If the headings are looked at without regard to entries, then the filing sequence is the following:

All name, topical subject, title, and series title headings file in alphabetic sequence according to the filing form of the heading. Conventional titles file in alphabetic sequence according to filing form under the associated main entry. The special heading "works by" files after the associated name entry.

Variations: Variations in sequence of headings are implied by the "variations" discussions given after conditions for printing headings and after sequence of entries.

Public Notes, "See" References, "See Also" References

The public notes immediately follow the associated heading, and precede all entries. The "See" references follow the associated heading if no notes are present. The "see also" references are printed last following all entries under the associated heading. The cross-references will print in alphabetical sequence; i.e., if more than one "see" or "see also" reference is present, the program will sort the multiple entries according to the filing rules.

The Content of Catalog Components

Entries		**element no.**
Main Entry (Except title):		
	principal classmark	01
	main entry statement	03
	conventional title	04
	title statement	05.1
	title extension	05.2
	edition statement	06
	place of publication	07
	publisher	08
	date of publication	09
	paging	11
	illustration	12
	size	13
	series statement	14
	notes	15
	collection codes	25
	item number	
	tracings	

The letter "T" if there is a title tracing.
The letter "S" if there is a series tracing.
Each of the actual elements if there are
element 16 to 19 tracings.

The above elements are given in the sequence in which they would be printed, except for the classmark, which is printed in a special fixed position that will be described in discussion of format below. The notations 05.1 and 05.2 refer to the first and second sub-elements of 05.

		element no.
Title Main Entry:	principal classmark	01
	conventional title	04
	title statement	05.1
	remainder of list as given for main entry, except that "T" does not print in tracings.	

		element no.
Added Entry, Subject Entry: Title Added Entry, Series Entry	principal classmark	01
	main entry statement	03
	conventional title	04
	title statement	05.1
	edition statement	06
	place of publication	07
	publisher	08
	date of publication	09
	item number	

Variations: The content of each type of entry can be specified as any arrangement of element numbers and sub-element numbers. Printing of part of an element by specification of sub-element numbers (such as 05.1 and 05.2 above) can only be done if it is known that the element has been divided with element sub-dividers (Δ) and the desired sub-element will always be in a fixed position (1st, 2nd, etc.) The specification of content is accomplished by listing the element numbers in proper sequence on an output control notice, in much the same way as has been done above. One variation that may be required is the printing of both the classmark in element 01 and that in element 02.

Headings

A heading will be said to be subdivided if Δ symbols have been used within the heading or if the heading consists of a combination of the major element from which entries were generated, along with additional headings associated with elements in the sub-sequence (such as the heading for a conventional title or the "works about" heading preceding subject entries under a name). The first part of a sub-divided heading is called the main heading. If a heading has been established as a single entry on the authority file, and is internally subdivided by means of dashes or other punctuation, it is not considered to be subdivided for purposes of this discussion, even though, in an intellectual sense, it is subdivided.

For a heading that is established and not subdivided the established form and extension are printed.

A heading that is not established (some titles, for example) is printed as entered on the catalog worksheet. The printing of the extension to a non-established heading is controlled by the output control notice.

If an established heading is subdivided, the printing information for each subheading is picked up from the authority file or the catalog worksheet, depending upon whether the subheading is established or not. The established headings will print exactly as they appear in the authority file.

For the model catalog at a sequence break which causes a heading to be printed, the entire heading, including the main heading and all subheadings is printed.

Variations: The rules about printing the established form extension and about picking up the printing information from the authority file or catalog worksheet are not subject to variation.

The rule about printing the entire heading at each sequence break is subject to variation. The output control notice allows an indication of whether or not the higher level headings are to print at sequence breaks. In addition it is possible to mark a specific established subheading on the authority file as a subheading which is to be printed alone without higher level headings. Thus it would be possible, for instance, to indicate that conventional titles are to print without repetition of the associated main heading.

Public Note

The entire public note is printed.

"See" and "See Also" References

The entire referenced heading (including the extension), as it has been previously established on the authority file, is printed. The word "see" or "see also" is printed once before the first referenced heading. All multiple references will follow, in alphabetical sequence, preceded by a semicolon and blank space. The word "see" or "see also" will not be repeated.

The Format of the Catalog Entries

Here the format will be given for each element in an entry of the model catalog. Then the format of the entry as a whole will be given. Typical variations will be discussed:

Classmark

The model catalog is assumed to use Library of Congress classmark. This classmark will be segmented into parts, if necessary, according to the rules in the appendix and the parts will be printed on separate lines, one beneath the other. The parts will be left justified. The entire array will be printed in a fixed position in the entry, defined below.

Variations: The entire classmark can be printed on one line. However it must be either one line or all of the lines created by the fixed editing rule for L.C. classmarks. No intermediate choice can be made. If a Dewey classmark is used it is also broken up by a fixed rule and single line or multiline printing can be specified. If any classmark is used, division into lines must be indicated by insertion of paragraph symbols(¶). Single or multiple line printing can then be chosen.

Main Entry Statement

The main entry statement will print as established in the authority file. If the main entry statement is written surrounded by brackets then if it matches the authority file entry on everything but the brackets, it will be printed surrounded by brackets.

Conventional Title

Conventional title will print as established in the authority file. It will automatically be surrounded by brackets.

Varation: The bracket printing can be eliminated.

Title Statement, Title Extension, Edition Statement, Place of Publication, Publisher, Illustration, Size, Notes

These are printed as written on the catalog worksheet.

Variations: If place of publication or publisher were established, then codes could be written in these fields, and established forms for printing could be assigned to the codes on the authority file.

Date of Publication

This is printed as written on the catalog worksheet. If a printing form is supplied, then the printing form is printed.

Series Statement

Established series statements are printed as established in the authority file, followed by the series statement extension. The series statement and the series statement extension are separated by a dash or a comma, as written on the catalog worksheet. Non-established series statements are printed as written on the catalog worksheet followed by the series statement extension.

Collection Codes

These are established codes. The printing form for each collection code is picked up from the authority file and printed. The collection codes are printed in succession with a dash separating them, unless a comma has been specified on the catalog worksheet.

Tracings

Each of the subject tracings is printed as established on the authority file. The subjects are numbered sequentially with arabic numerals starting with 1. Added entries are printed following the subjects. They are printed as established in the authority file. The successive entries are numbered with roman numerals starting with I. If a title tracing is listed, it is represented by the letter "T". It is numbered in roman numerals in sequence with the added entries. If there is a series entry for element 13 the letter "S" appears. It is preceded by a roman numeral in sequence after the title entry or added entries. Additional series entries are preceded by the word series and a colon, and the series heading is given. These are also numbered in roman numerals following in sequence behind the added entries title and major series entry. Two spaces are placed between successive tracings.

Variations: See below after "Overall Format".

Overall Format

The format description appropriate for a photo-composing machine is given here. The "point" used in giving certain dimensions below is 1/72 of an inch.

The text is set in a column 3 3/4 inches wide.

The elements of each entry are printed in the sequence given above in the disçussion of entry content. Successive elements are separated by two spaces. The printing is continuous, in block form with justified left and right hand margins There are no indentations. There is no paragraphing. Words are hyphenated at the right hand margin where this is needed. (It should be noted that no specifications are presented for a hyphenation program, since it is not proposed that such a program be written specifically for this system. In fact, the use of hyphenation is recommended only if a working program is available. If such programs cannot be obtained from another source, then it is probably best to print without hyphenation until they are readily available.)

The class mark is 7 point bold face. The text from main entry up to the start of notes is 7 point standard face. From notes to the end of the entry, 6 point standard face is used.

Variations in Entry Format: The printing of each entry of an element is governed by the following general rules:

1. For an established element the data to be printed is obtained from the established form in the authority file. For a previously established element it is possible to write a new printing form on the catalog worksheet. This would not ordinarily be done and does not occur in any of the examples given. It would only be done in an unusual case where, for some special reason, it was desired to override the established form for printing and cause some special printing to occur.

2. For a non-established element the information in the printing form written on the catalog worksheet is printed if it is present. Otherwise the information in the element statement is printed.

3. Whenever a statement is divided with Δ marks the rules given above for printing established and non-established information hold for each part separately. Printing of the entire element or of any subelement may be specified.

4. Each element may be specified to start on a fixed line within the entry, or at a stated number of spaces from the preceding element, or at a new line, a fixed number of lines from the last line of the preceding element.

5. For each element the starting point of the data on each line of the element is specified as a fixed distance from the left margin, the ending point is specified as a fixed distance from the left margin. The specification may be different for the first line of an element and for subsequent lines of the element. The column width is a result of the settings of the ending points of elements.

6. An element may be preceded and/or followed by fixed characters (as in the case of the brackets preceding and following the conventional title.) An element may be entirely replaced by fixed characters (as with "T" for title and "S" for series).

7. Type face may be separately specified for each element.

Headings

The heading will be printed in bold face, all upper case, 7 point type. The heading will start flush with the left hand margin, and run to as many lines as needed.

Variations: Any available type faces may be specified for the heading. The starting position within the line may be arbitrarily specified.

Public Note

Printed as a solid block in 7 point standard face, left and right justified in the margin. Paragraphing may be achieved by insertion of paragraph marks. This symbol will cause the information immediately following to be printed on a new line. If the line is to be indented, the corresponding number of blank spaces should be entered on the worksheet following the ¶ symbol. The blank spaces must be explicitly keyboarded.

Variations: The left and right margins for the note can be arbitrarily specified. The first line can be indented as compared to subsequent lines. Any available type face can be specified.

"See" and "See Also" References

The words "SEE" or "SEE ALSO" will be printed in 7 point bold all upper case. The reference heading will be printed in 7 point standard face, all upper case. The words "SEE" and "SEE ALSO" start at the left margin and two spaces are left between these words and the heading. If there is a qualifying statement separated from the reference heading by a △ symbol in the authority file record, this statement is separated from the heading by one space and is printed in upper and lower case.

Variations: The left and right margins can be set arbitrarily. Type face can be specified separately for heading and qualifies. Any available type faces can be used.

Overall Page Format

Spacings between components are as follows:

One blank line preceding a heading
One blank line preceding a public note
One blank line preceding the "SEE" or "SEE ALSO" reference

A heading is not printed in a column unless there are four lines remaining in the column following the heading. Headings are repeated on new pages. Pages are numbered sequentially in the center at the top of the page. The page format is two column with a 1/4 inch space between columns. Margins are determined in the offset printing process and need not be specified here. Printing is to be done on 8 1/2 x 11 sheets.

Variations: Variation in spaces between components is possible by means of the output control notice, subject to restrictions which are given in the detailed description of this notice. The other features are programmed in a fixed manner and require program changes if they are to be changed.

The Divided Catalog

For the most part the catalog specifications and variations given in the previous description hold for a divided catalog as well as for a dictionary catalog. The only differences are:

1. Sequence. Superimposed upon the alphabetic sequencing is a major sequence code which distributes the entries into the various catalog divisions. Within catalog divisions, the sequence need not differ from that for a dictionary catalog except that certain rules for sequencing different types of entries under the same heading in a dictionary catalog may not be needed in a divided catalog.

2. Establishment of headings. Certain headings which can be established in common for several types of entry (name used as author, name used as subject) may have to be established separately for the dictionary catalog. This is not necessary if the heading is used in exactly the same way in all catalogs. However, if there is any difference in the heading or the information associated with the heading on the authority file work sheet in the different catalog division, then the heading must be separately established for each catalog in which it is used. This is most likely to occur because of a difference in the public note or the "see" or "see also" references.

Sequence

The output control notice which controls the sequence of the catalog entries within major headings also controls the part of a divided catalog into which a heading will go. Each division of the catalog is given a number. On the output control notice for sequence, each type of entry is assigned the number of the catalog division into which it goes. Thus a variety of types of catalog division are possible. For instance, the following types of division are possible:

Division 1:

type of entry	catalog
main entry except title, added entry,	author
title entry, series	title
subject entry	subject

Division 2:

type of entry	catalog
main entry, added entry, title entry, series entry	author-title
subject entry	subject

Division 3:

Type of entry	catalog
main entry, added entry, name used as subject	name
title entry, series entry	title
topical subject entry	subject

Division 4:

Type of entry	catalog
main entry, added entry, name used as subject, title entry, series entry	name-title
topical subject entry	subject

Other types of division are possible. It is only necessary that it be possible to state the criteria for the division in terms of description codes and element numbers. Certain types of division may not be possible with the description codes given in connection with the recommended catalog worksheet. For instance, if a name catalog including place names were desired, it would be necessary to devise a description code for place names.

As described above for book catalogs, the content, format, and sequence of elements within a catalog entry are controlled by the output control notice. For card catalogs an appropriate control notice will be coded and entered into the system. The variations discussed above are possible for cards as well as for book form catalogs, but will probably not be as extensively used. The description given here is for the standard 3 x 5 catalog card; content, format, and sequence will follow traditional library practice execpt for certain minor variations noted below.

A separate catalog card will be printed for:

entries
public notes
see references
see also references

The appropriate heading will be printed as the top line of each card. The content and format of each heading is as described above for book catalogs. The only difference is that in book catalogs, the heading will print only at a break in sequence; for cards, however, each card will have its own heading.

CATALOG CARDS

A catalog card is printed for the main entry statement and each subject and added entry listed on the catalog worksheet. A card is printed for the title if "M" or "T" had been checked on the worksheet (element 05), and for the series statement if "T" had been checked (element 14). Additional title and series cards are printed if elements 18 or 19 had been entered on the catalog worksheet.

Public notes, see references, and see also references will be printed on separate cards for those established forms that have this information entered on the authority file worksheet.

It should be noted that the programs which update and maintain the catalog files are the same programs, no matter what the form of output - cards or books. These programs will maintain a machine catalog file in catalog sequence, and depending on the output control notice, will print either pages for books or cards. Because of this the sequence of the entries in the catalog is the same for books or cards, and the discussion above for book form catalogs will apply here. The major difference between books and cards is in the content of the various entries. As suggested above in the discussion of the content of catalog components for books, all entries except the main entry will be condensed. For card catalogs this will not be required - all cards will contain full information.

The computer system will, in effect, duplicate the procedures currently practiced in the manual production of catalog cards. The program will generate the designated number of tracings by duplicating the main entry and transferring the appropriate heading onto each separate entry. Except for the heading, all cards will be the same, containing full cataloging data as described above for the main entry in book catalogs.

The format of each element is the same as described for book catalogs except for the variations listed below:

1. The classmark will print justified against the right margin of the card.

2. Tracings will be printed at the bottom of the card, in the traditional card format.

3. Notes will always begin on a new line indented 2 spaces.

4. The date of cataloging will be printed at the bottom of the card justified against the right margin after all tracings.

5. If more than one card is required, the first card will have "(CONTINUED)" printed as the last line, and the next cards will repeat the main entry statement and the title followed by card 2, and card 3, etc. in parentheses. All cards will contain the item number.

In order to fully utilize the width of the printer, 13.2 inches, it is proposed that 3 cards across be printed at once. This makes it necessary to design the card with larger margins than is generally used in the library. Each card will have a left and right margin of .9 inch with a print area of 3.2 inches. Printing eight lines per inch, the maximum lines on the card would be 24 lines of 32 characters. However, the spacing of classmarks, the absence of hyphenation at the end of lines, and the formatting of tracings should yield an average of about 18 lines of 25 characters. The same print chain that can be used for printing book catalogs will also print the cards on 15" x 15" pre-drilled card stock.

THE CATALOG LIST

Whether the form of the public catalog is book or cards, it will still be desirable to have, for limited staff use, a computer printout of the latest catalog files. In the case where book supplements will be printed at intervals, it will be necessary for the staff to have access to all items cataloged during the supplement interval. The computer will therefore print, several times during the supplement interval, a cumulative list of all items cataloged since the last supplement printing.

All items that have been withdrawn from the catalog files (via the delete worksheet) during this time period will also be printed on a separate listing. These items will appear in catalog sequence under date of withdrawal.

The format of these listings will be identical to the format of the supplement when it is prepared for book production on a computer printer. The same programs will be used for both.

Though a definite schedule has been set for the production of catalog supplements, experience might show that the library would be justified in lengthening the supplement interval (for the public's use) and keeping the staff informed of the latest catalog items through the use of these computer printed catalog lists. If this proves true, then the book supplement schedule could be varied accordingly.

It should be noted that the system is so designed, that it can produce on demand, either the catalog or the shelf list in card or printed list form.

THE OUTPUT CONTROL NOTICE

The output control notice is coded by the library in order to define to the program the content, format, and sequence of the catalog entry.

Content

The content of the catalog entry is controlled by the content notice. For each type of entry a separate content notice must be coded. The type of entry is defined by the element of the catalog worksheet that generated the entry, its description codes, and the form of entry - main, added, or either. In other words, there may be varying contents for entries generated by different elements, or the same element with different description codes; also, the same element with the same description codes might generate different contents for main and added entries. Provision is also made to code separate notices for exception headings that must be treated in some unusual manner, or for a particular type of entry such as a journal article, that may require special processing.

For each type of entry defined, a content list is coded. The content list contains each element number that is to be printed, and a corresponding code (the format specification number) that refers to the format to be used when printing the element. The program uses this format number to find the appropriate rules for printing this element. Certain elements will print only when the catalog worksheet has indicated that they are entry-generating elements. For example, the system is designed so that some subjects can be entered on the catalog worksheet for retrieval or searching purposes only. They are not to appear as tracings in the catalog entry. The content list has provision for indicating those elements that should not print unless they are to generate their own entries.

Elements are entered in the content list in the same sequence that they are to be printed in the body of the entry.

In the content list an element can be represented in three different forms. For example, the series element (14) can be entered in the content list as 14; 14.1, 14.2, etc; or 14-1, 14-2 etc. This allows the library to include only certain parts of one series element, or any specified series element.

If an element number is entered in the content list without a dash number, and there are several dash number elements on the catalog worksheet, then all multiple elements will be printed (in sequence by dash number). For example, a catalog worksheet contains three subject entries numbered 16-1, 16-2, 16-3. The content list of the content notice contains 16 with the specified format number. The program will interpret this to mean that all subject headings are to print in sequence by dash number. If only 16-2 had been entered in the content list, then that subject tracing would be the only one printed in the catalog for this type of entry. The other two subjects, 16-1 and 16-3, would not print.

If an element is entered in the content list without point numbers and the catalog worksheet contains several subdivisions of the element, then all subdivisions will be included in the content list. For example, a catalog worksheet contains a series statement "Purdue University Series in Drama△ no. 5", and the content list contains 14 with the appropriate format number. The entry will then print "Purdue University Series in Drama - no. 5". However, if the content list contains 14.1 only, then the extension, -no.5, would not be included in the entry.

Sequence

In order to control the sequence of entries within the catalog, a sequence notice must be coded for each type of entry. The type of entry is defined in the same manner as for the content notice; i.e., the element number generating the entry, the description codes, and form of entry-main, added, or either. A catalog code, defining in which catalog this entry is to appear, must also be entered. The code specifies either a non-divided catalog (dictionary - where all entries will appear) or one of the divided catalogs prepared by the library.

Following this identification (type of entry and catalog code) the sequence list is completed; this contains the list of element numbers entered in appropriate sequence for filing. If an element that is to be included in the filing sequence is missing for a particular catalog entry, then the general rule is that the missing element will be treated as a blank and the entry will precede all similar entries that have this element. However, for certain missing elements it may be desirable to sequence the entry disregarding the missing element; i.e., as if this element should not have been included in the sequencing. The elements that are to be disregarded when missing will be entered in the sequence list preceded by an asterisk.

Conventional title is an example of this exception to the general rule. If element 04 (conventional title) is entered on the sequence notice without an asterisk, then under "Shakespeare", "The Twelfth Night" (which has no conventional title) would file before "The Prince of Denmark" (whose conventional title is "Hamlet"). However, if an asterisk precedes the element number, then the program will sort the entries, disregarding the empty conventional title element, and Hamlet will appear first.

The first element entered in the list will always be the element that generated this entry. If more than one suce element has been entered (with dash numbers) on the catalog worksheet, then the program will assume that the element number entered first on the sequence list refers to the particular dashed number that generated this entry.

If the rule is that only the main part of an element is to be included in the sequence, then the element number should be entered as a point number. For example, a library that does not desire the title extension to be included in the filing sequence would enter 05.1 for the title element (instead of 05).

Each element will contain a corrseponding heading format specification number. If the heading format specification number is non-zero, then a sequence break on the preceding element will cause printing of the corresponding heading in the format defined by the specification number. If the heading format specification number is zero, then no heading will print at a sequence break. For example, if the library desired that for a title added entry, each new edition (or date of publication) should print as a heading, then for the title added entry sequence notice, a non-zero heading format specification number should be entered following element 06 (or following 09-date of publication) in the sequence list.

At any point in the sequence the following information enclosed in angle brackets can be added to the list:

⟨actual filing characters⟩

The information in the brackets will be inserted by the program when filing the entry under control of the sequence notice. For example, if a name used as an added entry is to file before the name used as a subject, then after the first element of the sequence list the following file characters should be entered:

⟨1⟩ for added entries
⟨2⟩ for subject entries

The information in the print form brackets will be printed by the program at a sequence break determined by the actual characters inserted in the filing form brackets. Thus, in the example cited above, if "works about" is to print before subject entries, but nothing is to print before added entries, the format specification number entered on the line where ⟨1⟩ appears should be 00, while on the line where ⟨2⟩ appears a number should be entered that refers to a format specification that will print the fixed heading "works about".

As noted above for the content notice, certain types of catalog entries (such as journal articles) may also require special sequence control notices. The content and sequence of these catalog entries can be controlled by coding special notices to be used in these exception cases. For specified established codes of certain elements, the program will check these codes before generating the entry to be printed. If the code calls for an exception notice, it will be applied instead of the standard control.

Format

The format of each type of entry is controlled by the format notice which contains specially coded formatting and printing rules for each format specification number. Each set of coded formatting and printing rules will be assigned a unique specification number to which the content and sequence notices will refer. The content notice refers to specification numbers for element printing, while the sequence notice refers to heading specification numbers in the case where a heading is to print at a break in sequence.

The following of is the list of information coded onto the format notice for each specification number (for elements and headings):

1. Typographic code.
2. Space from preceding element - either the number of characters from preceding element, a new line and the number of lines of space from preceding line, or a new line at a fixed line number of entry.
3. Character position for starting first line
4. Character position for ending first line
5. Character position for starting subsequent lines
6. Character position for ending subsequent lines
7. Repeat higher level subheadings on line with this subhead- yes or no; used only for headings.
8. Ignore paragraph mark - yes or no. A symbol entered on the catalog worksheet will cause printing on a new line, unless the format notice overrules this.

9. Special edit routine - a code used to identify a special program to edit any specified element that must appear in the catalog in some prescribed format, such as multi-line printing of the classmark.

10. Constant characters preceding - actual characters that are to precede the element or heading, such as [for conventional title. A code can also be entered here to indicate that the element is to be preceded by a consecutive number, arabic or roman, as in the case of tracings.

11. Constant characters following - actual characters that are to follow the element or heading, such as]

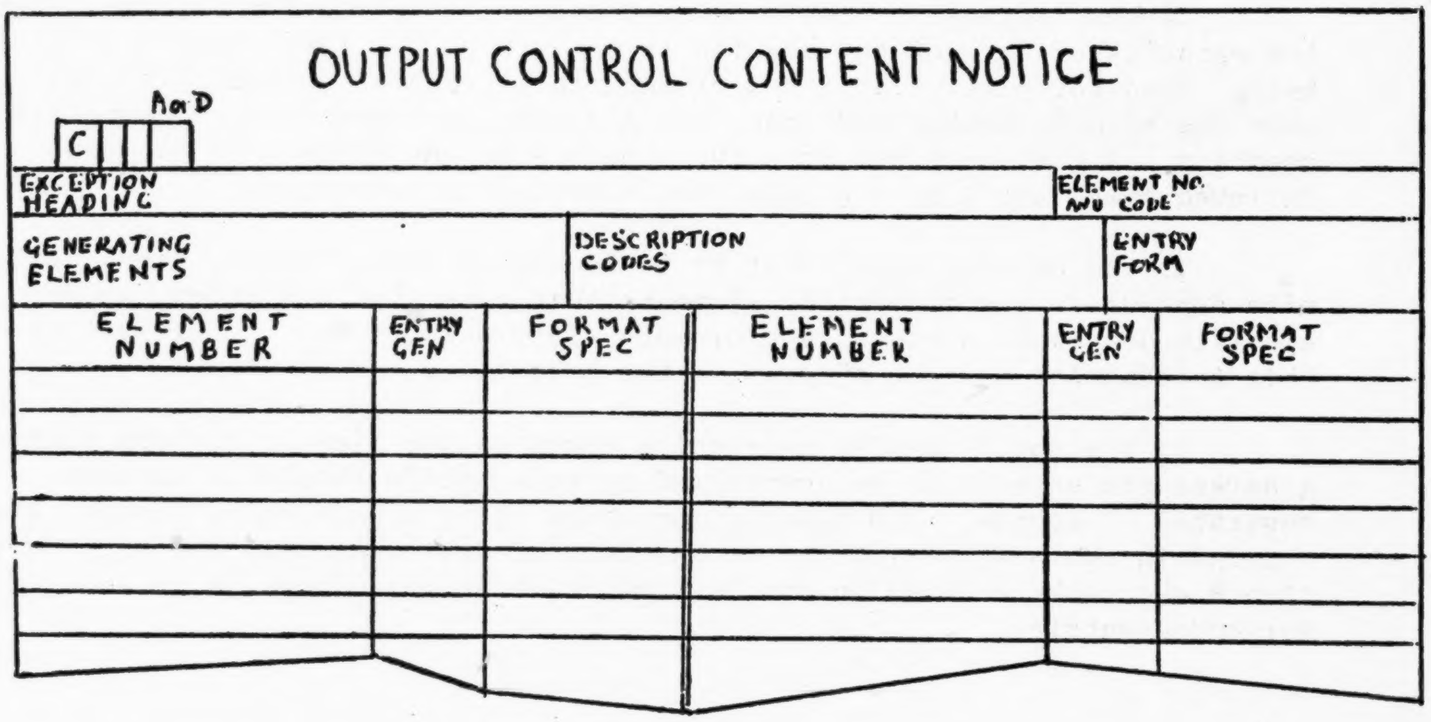
12. Constant characters replacing - the actual characters that are to replace what was entered on the worksheet, such as T for actual title, or S for actual series statement.

Special format notices with fixed pre-assigned numbers are provided for printing of cross references and public notes.

Coding the Output Control Notice

Three output control notices must be prepared by the library - content, sequence, and format.

Fig. 7 is a sample output control content notice.



OUTPUT CONTROL CONTENT NOTICE

A or D

C

EXCEPTION HEADING

ELEMENT NO. AND CODE

GENERATING ELEMENTS

DESCRIPTION CODES

ENTRY FORM

ELEMENT NUMBER	ENTRY GEN	FORMAT SPEC	ELEMENT NUMBER	ENTRY GEN	FORMAT SPEC

In the top left a C is preprinted to identify this form as a content notice. Following the C two spaces are provided for numbering the various content control notices that may be coded. An A or D is entered to indicate whether this is an addition of a new notice or a deletion of an existing notice.

A separate content notice can be coded for the following conditions:

1. Different types of entries. The type of entry is defined by the element of the catalog worksheet that generated the entry, the description codes, and the form of entry - main, added, or either.

2. Various portions of the catalog. Headings can be specified as exceptions, and all entries appearing under this heading will be controlled by the control notice.

3. Special Material. The different physical forms - maps, music scores, phonorecords, etc., the various bibliographic forms - analytics (journal articles), doctoral dissertations, government publications, etc., or any established element on the catalog worksheet can have its own control notice.

4. A combination of any of these conditions. Though it is highly unlikely that a library would actually need all possible combinations, it is possible to code a separate notice for any combination of all variations of each of the above conditions.

A library could decide, for example, to code a special notice for a particular subject (exception heading "Folk Music") when cataloging musical scores (element 22, code MU), for a certain type of entry (title to be traced-generating element 05, form of entry A).

If the control notice is being coded for an exception heading, then the established form of the heading is entered on the first line. If it is being coded for particular types of materials (such as journal articles) then the element number and code (23 AN) must be entered in the specified position. The element number - two numerics or one alpha - is entered, followed immediately by the code; no delimiter is necessary.

If the catalog entry that is to be controlled by this content notice also depends on the element or elements that generated the entry, and/or specific description codes, and/or entry form-main, added, or either, then this information must be entered on the next line.

In the space labeled generating elements the element numbers that generate the entries to be controlled by this notice should be entered separated by commas. The description codes (also separated by commas) are entered in the next position. If the control notice is only for main entries then M should be entered in the last position on this line. A is entered for added entries.

If the control notice is for main and added entries, then this position is left blank, and the program will utilize this control notice for both main and added entries.

If any of the positions are left blank, the program will assume that the notice is to include all possible conditions controlled by that position. For example, if the description code field is left blank, then all description codes within the specified element will be controlled by this notice. If all entries under an exception heading are to be controlled by this notice (no matter which element has generated the main or added entry for this heading), then all positions are left blank; only the exception heading is entered. The portion of the catalog containing the entries under this heading will then be affected by this control notice.

For each of the conditions defined a content list is coded. The element numbers are entered in the same sequence that they are to be printed in the body of the entry. They can be entered in three different forms.

1. Two numerics or one alpha character (NN,A)
2. Dash numbers (NN-NN, A-NN)
3. Point numbers (NN.NN, A.NN)

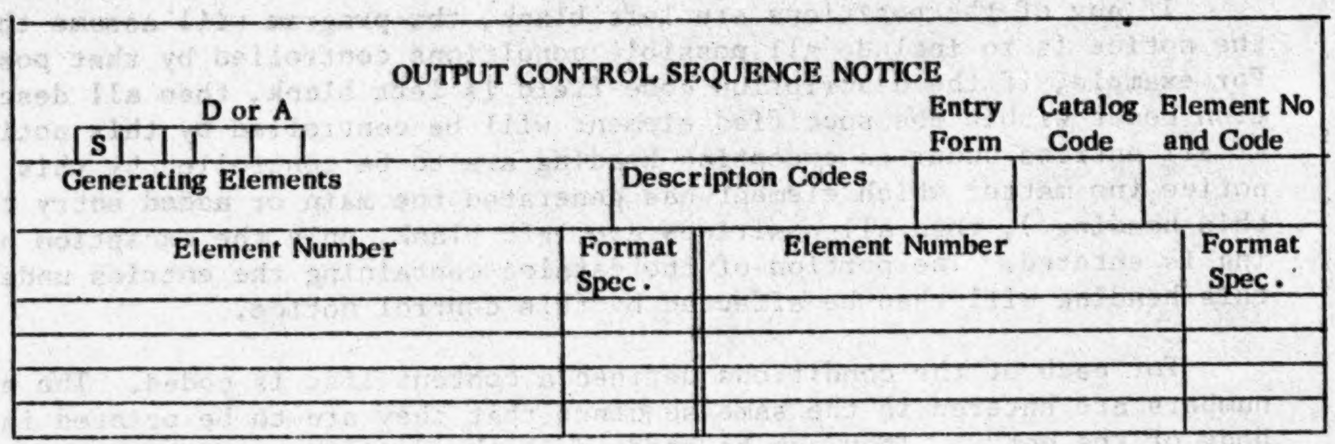
The use of dash and point numbers is described above.

It has been previously noted that the proposed system allows for the design of a catalog worksheet that can contain elements that are not always to be printed in the body of the catalog entry. A library might decide, for example, to enter a large number of subjects for possible future retrieval, yet only want a few subject tracings to appear in the catalog. After the element number position in the content list, a space is provided to indicate that the element is to print in the body of all entries only if it is to generate its own entry. A "G" is written into this position for this purpose. Otherwise it is left blank.

The next position should contain the format specification number, i.e., the number of the format control notice associated with the printing of this element.

Fig. 8 is a sample sequence notice.

FIG. 8



OUTPUT CONTROL SEQUENCE NOTICE

D or A

S

Generating Elements	Description Codes	Entry Form	Catalog Code	Element No and Code

Element Number	Format Spec.	Element Number	Format Spec.

In the top left, an S is preprinted to identify this form as a sequence notice. Following the S, two spaces are provided for numbering the various sequence control notices that may be coded. An A or D is entered to indicate whether this is an addition of a new notice or a deletion of an existing notice.

Separate sequence notices can be coded for the same conditions described for the content notice:

1. Different types of entries
2. Various portions of the catalog
3. Special material
4. Any combination of the above.

After making the appropriate entries for exception heading, element number and code, generating elements, description codes, and entry form, a catalog code defining in which catalog this entry is to appear, must also be entered. The code specifies either a dictionary catalog or one of the divided catalogs prepared by the library.

The sequence list, containing the numbers of those elements that are to be used when filing this type of entry, is then completed. The element numbers are entered in the appropriate filing sequence. As noted above, if an element that is not present in the catalog entry is not to be considered as part of the filing sequence, then the element number is entered preceded by an asterisk. If no asterisk is present, a missing element will be treated as a blank and will precede all similar entries that contain data in this element.

The first element number entered on the sequence list should be the number of that element that generated this entry, since it will be the major filing element. If the library decides that for a particular type of entry, only the main part of the heading should be included in the sequence, then the element number should be entered as a point number, excluding those subheadings that are not to be included in the sequencing. For example, if the series extension should not be part of the filing sequence, then the series element is entered as 14.1 instead of 14.

For each element number in the sequence list, a format specification number is entered. This number identifies the format control notice that will be used when printing the related element as a heading to the catalog entry. If a valid format specification number (01-99) is entered for an element, then a sequence break will cause the printing of the corresponding heading in the format defined by the format specification control notice. If no heading is to print at a break in sequence, then two zeroes are entered as the format specification.

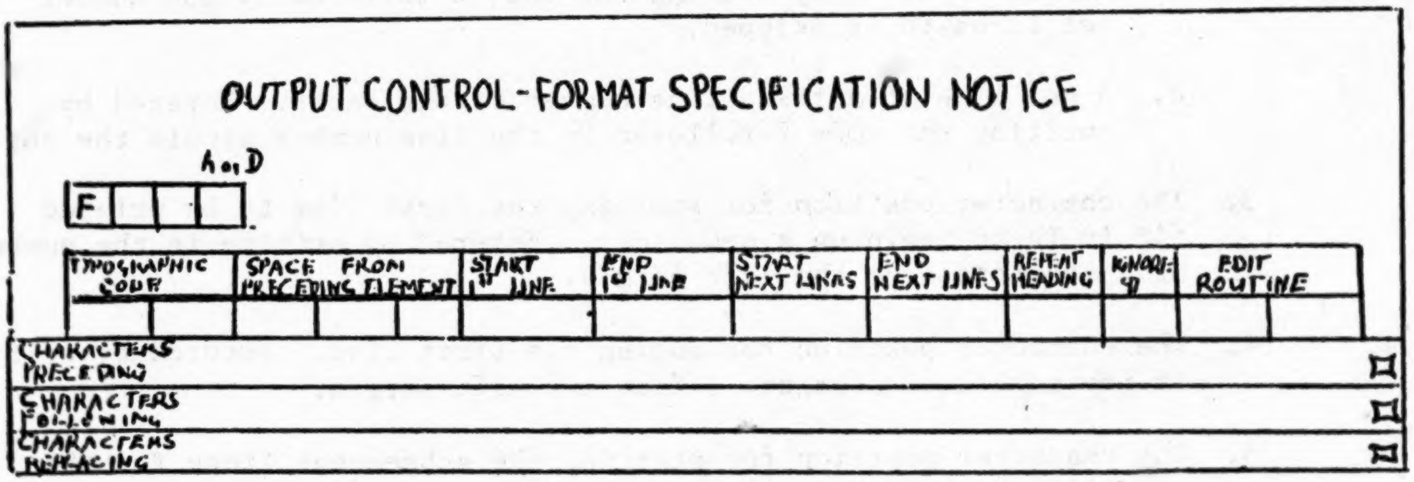
As previously noted, at any point in the sequence list, filing characters can be inserted, enclosed in angle brackets.

⟨actual filing characters⟩

Examples of the use of filing characters and print form were presented above in the general description of the output control notice.

Fig. 9 is a sample specification notice.

FIG. 9



OUTPUT CONTROL-FORMAT SPECIFICATION NOTICE

A or D

F

TYPOGRAPHIC CODE	SPACE FROM PRECEDING ELEMENT	START 1st LINE	END 1st LINE	START NEXT LINES	END NEXT LINES	REPEAT HEADING	IGNORE ?	EDIT ROUTINE

CHARACTERS PRECEDING ☐

CHARACTERS FOLLOWING ☐

CHARACTERS REPLACING ☐

Specially coded formatting and printing rules are entered on the format notice and referred to (via specification number) by the content and sequence notice. The content notice refers to the format control for the printing of elements within the body of the catalog entry, and the sequence notice refers to the format control for the printing of the headings at a break in sequence.

In top left an F is preprinted to identify this form as a format specification notice. Following the F, two spaces are provided for numbering the various format specifications that may be coded. They can be numbered from 01 to 99. (As noted above a format specification number of 00 entered on the sequence notice means that no heading is to print at a break in sequence.)

Ten fields for fixed length information, and three fields for variable information are provided in the format notice.

1. The various type fonts that are available for printing the catalog will be coded with a two character code, and entered in the first position.

2. In the next position should be entered the point at which printing of the specified information is to begin. Three blank spaces are provided to enter a one character code followed by two numeric digits. The print position can be entered for three different cases:

   a. The number of characters from preceding element. Entered by writing the code C followed by two digits representing the number of blank spaces that should separate the two elements.

   b. A new line and the number of lines of space from preceding line. Entered by writing the code L followed by the number of lines to be skipped.

   c. A new line at a fixed line number of the entry. Entered by writing the code F followed by the line number within the entry.

3. The character position for starting the first line to be printed (if it is to begin on a new line). Entered by writing in the number of characters from the left margin.

4. The character position for ending the first line. Entered by writing in the number of characters from the left margin.

5. The character position for starting the subsequent lines for the specified information. Entered by writing in the number of characters from the left margin.

6. The character position for ending the subsequent lines. Entered by writing in the number of characters from the left margin.

7. The next space is used only for subheadings. If the higher level subheadings are to be repeated along with this subheading, then a Y is entered in this space. If this subheading is to print alone, then an N is written here. (See description of authority file worksheet for similar control function.) An X is entered for elements and major headings.

8. The ¶ symbol entered on the catalog worksheet will cause the information following the ¶ symbol to print on a new line. If the ¶ symbol is to be ignored, a Y is entered here. Otherwise an N is written.

9. A two character code will be used to identify any special edit routines that will be used to format specified elements or headings in some prescribed fashion. If no edit routine is necessary, 00 is entered here.

10. If a series of elements are to be numbered sequentially, then an entry is made in the "sequence number" field. (This is intended primarily for the numbering of tracings.) The codes are:

    A - Number all elements with same element number sequentially in Arabic

    R - Number all elements with same element number sequentially in Roman

    AC - Number in Arabic and continue the sequence established for the preceding element

    AR - Number in Roman and continue the sequence established for the preceding element.

11. If the library desires that special characters precede the element or heading, they should be written on the next line.

12. If constant characters are to be printed following this element or heading, they are entered on the next line.

13. If constant characters are to replace what was entered on the catalog worksheet, theyare entered on the last line.

The last three variable length positions are followed by the ⌑ symbol to delimit the data.

To control printing of cross-references and public notes, format specification notices with special predefined alphabetic codes in the specification number field are used. These notices and the special codes are:

PN - Public note
S1 - First see reference
S2 - Other see references
SA - First see also reference
SB - Other see also references
QQ - Qualifying statement following a heading in a cross-reference

THE AUTHORITY FILE LIST

During each computer cycle, authority file worksheets - new and changes- will be processed, and the machine authority file will be updated. The computer will print three types of authority file lists:

1. The complete authority file
2. Cumulative complete to supplement
3. Cumulative supplement to cycle.

The schedule for printing these authority file lists is discussed below (under the heading "The Schedule"). The complete authority file, reprinted periodically at optimum intervals will contain all authority file entries in the system. During the interval between printings of the complete authority file, a supplement will be printed, containing all entries into the system since the last complete printing. Each supplement printing will be cumulative; i.e. it will contain authority entries included in the previous supplements as well as new entries. In the interval between supplements, a smaller cumulative listing will be printed so that authority information is available to the staff as soon as it enters the system. For each cycle during the interval between supplement printings, the computer will list all cumulative authority activity since the last supplement printing.

The type of data on all three lists will be the same. All information entered on the authority file worksheet will be printed on these lists.

The top line will contain the authority file number-main, or number of the auxiliary file. It will also state whether the entry, if on the main authority file, is to be used only as a main heading or as a subheading as well. If it may be used as a subheading, then the codes -Q,P, and/or H, which control heading printing and sequence (see discussion of authority file worksheet above) will follow.

The format of the list is as follows:

established form:
established form extension:
filing form:
code:
description codes:
cataloger note:
public note:
see references:
see also references:
see from references:
see also from references:

Any element that is in error will be starred *. The error codes will be printed on the authority audit list, described below.

The computer will print each element on a new line, and will also begin a new line whenever it encounters the ¶ symbol. The ¶ symbol is entered by the cataloger on the authority file worksheet to control the printing of new lines. Description codes will be separated by commas.

It should be noted that consideration was given to the use of an output control notice for the authority file list, as was specified for the catalog. However, the authority file list is used only by the staff and will not be distributed to nor used by the public. The content of each authority entry is fairly constant and will not be subject to the variations of catalog entries. Also, the program for printing is relatively simple since it lists, element by element, the information contained in the machine authority files, with no major changes in content of sequence. If the library finds from experience that a changed format will be necessary, it should not be a major job to modify the authority file print routine. If, however, it becomes evident that frequent variations will be desired, the program should be modified to accept an output control record as its parameters.

Four main authority file lists will be printed. All names, anonymous classics, and uniform headings will be listed together. A separate subject authority file will also be printed. Established titles and series will appear together on one list. Conventional title and name combinations will be printed on a separate list. If different combinations of authorities are desired, very simple program modifications will effect this, or a quite simple control card procedure can be added.

Each main authority file list will be printed in catalog sequence; i.e., all filing is word by word in strict alphabetic sequence according to filing form, as either entered by the cataloger on the worksheet, or developed by the programmed filing routine. The same rules set down above for the sequencing of catalog entries will be followed for authority file lists. See discussion above under "The Sequence of the Catalog" for a full description.

The auxiliary authority files will be listed separately by file number. Each will be in strict alphabetic sequence by established form.

AUTHORITY FILE AUDIT LIST

For all additions and changes to the authority files during a cycle, the computer will prepare a report, listing the entries in their prior unchanged form and their new form. For the changed elements of an authority file entry the computer will list:

established form:
element number and description:
previously entered as:
changed to:
errors:

For the new authority entries, the format of the audit list will be identical to the format of the authority file list, except that error codes will be noted after each element that is in error.

The following error codes will be used to identify any errors noted by the program. For the authority file worksheet, any error will cause the program to reject the input (unlike the catalog worksheet that will be processed and flagged). No information will be added to the files and a revised worksheet will have to be entered.

IT - Invalid Type -	the N(new), C(change) or D(delete) has not been entered correctly.
IC - Invalid Code -	the description codes or indicators (such as file number, S, Q, P, H) have been entered incorrectly.
NF - No established form -	one or both of the headings involved in a cross-reference(see from, or see also from) can not be found on the authority file. It has either been misspelled or has never been established before.
EF - Established Form -	a search of the authority file has indicated that the form, entered as new, has already been established.
IM - Identification Missing -	the established form has not been written in the prescribed position on the authority file worksheet.

PROOF COPY AND ERROR LIST

As noted above in the description of the new title notice, the computer will print on a proof copy worksheet any information that is available in the master files for the particular item being cataloged.

Upon receipt of a new item (that is to be cataloged) at the library, a new title notice is entered into the computer system. If the LC card number is available, that is all that need be transcribed on the new title notice. If the LC card number is not available, author, title, publisher, edition, and date should be entered. The program will search the master files for matching LC copy. If LC copy cannot be found, the computer will print the new title information on a proof copy worksheet. If matching LC copy is picked up from the files, then the computer will print the LC information as proof copy for review by the cataloger.

Whenever a new title notice generates a search in the LC files, and LC copy is found, the computer will indicate with an "N", the LC headings that are new; i.e., all headings that are not found on the authority file will be flagged as new. This should save the cataloger the time needed for a manual authority search before completing the catalog worksheet.

The cataloger will review the information and note any changes on a catalog worksheet along with any appropriate indicators and description codes. If an indicator or code is to entered, then the cataloger will write only the information contained within the indicator angle brackets. For example, if LC did not trace the title, and the library desires to generate a title entry, then the cataloger will enter T in element 05. The T will be keyboarded by the typist and the rest of element 05 will remain unchanged. However, if a filing form, or any other field (except indicators) must be changed, then the whole element must be rewritten and keyboarded.

The corrections on the catalog worksheet (changed type) will be entered into the system, after which time it will be treated exactly as a new catalog worksheet; i.e., it will be matched against the authority file, processed, and new proof copy will be printed.

For each completed catalog worksheet (new or change) entered into the system, proof copy and error diagnostics will be printed by the computer.

The purpose of proofreading is twofold. It must first be ascertained that no errors were made when the completed worksheet was keyboarded. Secondly, the cataloger's work must be checked to assure that the appropriate format, content, established form, code, etc. was entered on the catalog worksheet.

For the catalog worksheet proof copy, the computer will list, element by element, the exact information entered. For specified elements the way in which it will file and how it will print in the catalog will also be listed. This will occur whenever the element is established, and a filing or printing form will be specified by the authority file entry, or when the cataloger enters a non-established element with a corresponding filing or printing form.

The format of the element by element listing on the proof copy is as follows:

element no., element name:
entered as:
will file as:
will print as:
*errors:

Verification will also be done by the computer programs. Any errors discovered through the computer check will be listed after each element following the heading "*errors". If no errors are found, the last line of the proof copy page will read "NO ERRORS".

If errors are discovered, then the bottom line of the proof copy page will repeat the element numbers that are in error following the heading "*ERRORS:".

The following error codes will be used:

I I - Invalid Item Number - too many or too few digits, or missing completely.

A I - Allocated Item Number - the item number entered on the new title notice or on a catalog worksheet marked N (new) has already been used for another item.

In both of the above cases, the computer will assign an arbitrary item number to be used for making corrections. It will print out following the error code. A new catalog worksheet, type C (for change), should be prepared with the computer-assigned item number, followed by a comma and the new number, entered in the appropriate position.

IT - Invalid Type - a character other than N(new) or C(change) has been entered.

In this case, the computer will search the files. If a matching item number is found then it will be assumed that the catalog worksheet is to be used for change. If a matching item number is not found, the worksheet will be treated as new.

IC - Invalid Code - the indicator field, enclosed in angle brackets, has invalid indicators or description codes.

The invalid codes will be printed following the IC. A catalog worksheet type C(change) should be entered with the indicator field correctly written.

NF - No Established Form - the computer has searched the authority files for this form, and could not find a matching entry. It has either been misspelled or has never been established before.

EF - Established Form - a search of the authority files has indicated that the form entered on the catalog worksheet to be established has already been established.

In both of the above cases, the form entered on the catalog worksheet, and found to be in error, will be printed after the error code NF or ER.

BE - Blank Element - an element which should be present has not been entered on the catalog worksheet.

When the following elements are not present a BE flag will be printed:

classmark
main entry (except when title is main entry)
title
place of publication
publisher
date
paging
size

There will be many cases when the above elements will legitimately not have any information. In these cases the cataloger will enter the special symbol Ƀ to signal that the entry will not have information in this element. If the symbol Ƀ was inadvertently not entered, and the computer listed the element as an error with a BE code, then the cataloger will enter a change containing the Ƀ symbol in the flagged element.

The sequence in which proof copy and error lists are to be printed has not as yet been fully determined. Only experience can show the best sequence for optimum coordination of the automated, professional, administrative, and clerical procedures required in reviewing and correcting proof copy.

At present the following scheme is suggested, with the idea that the programming for this sequencing should be done at an early stage of the project and may be subject to change.

For the catalog proof copy, all items for which no machine-detected errors have been found should be listed first in item number order. Presumably, the catalog worksheets file will be maintained in this same order for easy proof copy matching.

The second batch should contain all catalog proof copy for which authority-related errors have been discovered. This too will print in item number sequence.

The third and last batch should list all items for which any non-authority-related errors were found, also in item number sequence.

ERROR REMINDER LIST

A cumulative error reminder list is produced by the computer after a specified number of cycles. This list contains all catalog items and authority file entries that were flagged as in error, or were held off the files by the special hold notice. Catalog worksheet errors will be listed separately from authority file worksheet errors.

The error reminder list for catalog entries will contain the item number, date proof copy was issued, and the elements that have been flagged and still remain uncorrected, and are not part of the catalog file. The authority file error reminder list will contain the identification (established form) the authority file number, date proof copy was issued, and the elements in error.

These lists should speed up error correction and serve as a control for all items and authority forms that have been entered into the system but have not yet been included in the files.

III. COMPUTER PROCESSING AND RELATED PROCEDURES

The discussion presented in this section will be limited to a general description of the procedures related to computer processing, which should be clear to non-computer personnel. It will include the description of the schedule, the clerical and administrative procedures associated with input and output, the general functions of the system, and the way in which LC copy will be treated and combined with the library's files.

A separate technical memorandum is being prepared for computer personnel, which will contain flow charts, descriptions, file layouts, record content, etc. and all information necessary for programming the system.

THE SCHEDULE

It is obvious that a schedule for any system, automated or manual, is closely related to the volume of work, and equipment and/or manpower utilized for processing. It is also difficult to predict what the optimum time interval between processing should be, before any actual working experience with a running system. The schedule discussed here is therefore tentative and will be subject to change as new experiences are gained. The time intervals used to describe the schedule will also not be expressed in terms of days or weeks but rather in terms of the basic computer cycle. Actual time intervals will be estimated for each of the cycles in the proposed statewide system.

The specified system is divided into three major cycles.

1. The basic cycle will accept all inputs, edit and transcribe the data onto machine files, and produce the cumulative listing of catalog and authority activity since the last printing of the supplement. If catalog cards are to be produced, they are also printed during the basic cycle together with proof copy and error lists for all catalog and authority entries, and catalog worksheets for all new title notices. For a statewide system, with an estimated cataloging volume of about 50,000 a year, the basic cycle will probably be run on a daily basis.

The automatic inclusion of catalog and authority file entries onto the error-free computer master files is also a function of the specified number of cycles. The library will decide on this preset time; after the specified number of cycles have passed, and no indication of error or special requests have been received by the computer, it will be assumed that the proof copy has been okayed, and the entry will become part of the permanent files. The library will also decide on the time interval for printing the error reminder notices. If no corrections have been received by the computer after the specified number of cycles have been run, the computer will list all catalog and authority entries flagged as errors, for which the expected corrections have not been entered.

Entries for which special request undated hold notices have been entered to delay their inclusion in the files, will also be listed along with the error reminders.

2. The supplement cycle will print the cumulative supplement of the book catalog and authority file. During each basic cycle, the supplement to date catalog and authority files will be updated. During the supplement cycle, the supplement to date files are merged with the main to supplement files and a cumulative supplement is printed for the book catalog and authority file. This supplement will contain all activity since the last printing of the main files. Since the staff will receive the latest catalog and authority information from the basic cycle, the interval between supplement printings will affect the public only. The type of public service provided by the library should be the criteria for deciding the interval between supplement printings. It is obvious that a large reference and research library that caters to users who must always have the most recent catalog, should choose the shortest interval-a new supplement every month. Smaller libraries, and libraries that deal mostly with non-research material might choose a larger interval, such as every three months. Another factor that must be considered is the cost of producing book supplements. The yearly cost for printing monthly supplements is almost three times the cost of printing quarterly supplements.

3. The main cycle will print the main catalog and complete authority file. During each supplement cycle, the main to supplement files will be updated. During the main cycle, the main to supplement catalog and authority files are merged with the main files and all entries in the system since its inception are printed. If monthly supplements are produced, then the optimum interval (based on cost factors) for main catalog production is not constant. For a period of 20 years, the first main catalog will be produced after 10 months, the interval will increase by one month for each main printing, and reach 23 months after 19 years. If quarterly supplements are printed, the main will be produced at the corresponding optimum interval.

CLERICAL AND ADMINISTRATIVE PROCEDURES

The clerical and administrative procedures associated with each input and output have been noted in the corresponding descriptions. The general procedures will be discussed here. The steps taken, from the time a new item is received at the library to its being printed in the catalog, are traced.

The first step in the process is the inclusion of the item on one of the computer files. As noted above, once the acquisitions procedures are automated, an order for a particular item will serve to enter the item into the system. Until such time, however, the new title notice must be entered with appropriate information. All items, new to the system and ready for cataloging, are forwarded to the input preparation group. These typists will be trained to record, on a blank new title notice, the LC card number if it is printed on the item; if no LC number is available, they will enter on a prenumbered new title notice all pertinent information from the title page-author, title, publisher, edition, and date of publication. The number preprinted on this notice becomes the item number, the unique identification for this particular item used throughout the cataloging process. A printed copy of the new title notice is attached to the item which is then shelved in item number sequence to await receipt of the computer printed catalog worksheet.

The new title notice is entered into the computer cycle where the programs will search the files to find matching LC copy. If LC copy is found, the computer will print the LC information on a proof copy worksheet. If LC has not forwarded catalog copy, the data entered on the new title notice will be printed as proof copy. These worksheets printed in item number sequence will be inserted in their corresponding items which were shelved in item number sequence. The item, along with its worksheet, is forwarded to the cataloging section.

With item in hand, the cataloging group will complete the required searches, and enter on a catalog worksheet all corrections to LC copy, or new cataloging data. Corresponding authority file worksheets, whenever necessary, will also be completed. The worksheets will be sent to the input preparation group where they will be keyboarded and entered into the computer system.

The computer programs will edit and transcribe the data onto internal storage files and produce proof copy and error diagnostics for both the catalog and authority file entries. Proof copy for which no computer-discovered errors were indicated will be forwarded to proofreaders who will match the computer printed copy against the entered worksheets. Proof copy with error indications will be returned to the catalogers for correction. The corrections are entered into the system which will then print new proof copy and error diagnostics.

It is unnecessary to re-enter into the system the proof copy that needs no corrections. The library will decide on a preset time period (it will probably be about one week), after which time the computer will automatically include in the catalog files all new items for which error free proof copy has been printed and no corrections received. The catalogers will have the option of delaying this procedure by entering a special request hold notice which will cause the system to refrain from including the item on the catalog or authority files until a specified date or until notified via the special request notice to enter now. The enter now notice is also used to cause the computer to immediately include the specified items in the catalog without waiting the preset time.

The entry is then merged with the computer files and, at the scheduled time, the prescribed output is printed by the computer.

The authority file and catalog lists (described in the output section) will replace the current catalog and authority card file. The staff will have access to multiple copies of the latest computer listings and will utilize these listings in conjunction with the printed book catalogs.

Since the computer will produce a list of all authority activity after every computer cycle, there does not seem to be a need for an authority file control copy in which the latest authority information would be manually entered in order to avoid duplication of work. Though this has been previously suggested, further investigation has revealed that there is very little danger of duplicate effort in establishing new authority as long as the latest activity is made available to the staff within one or two weeks. In the present system, authority activity will be printed after each cycle, and for a statewide system it is probable that a new cycle will be run each day. Some librarians have expressed the opinion that a delay of several weeks will also do no harm, since it is rare for an author, unestablished up to this time, to have more than one item cataloged in this short period. The same is true for subjects. It seems to be extremely unlikely that a new subject would have more than one entry under its heading in a period of several weeks. Also, it was pointed out, the establishing of subject headings is specialized, and any particular subject is generally handled by the same cataloger.

For both the catalog and authority file, the staff will have to search in three alphabets. The main catalog and complete authority file will contain all entries in the system, from the time of its inception. The cumulative supplement will contain all information entered into the system from the last main printing until the latest supplement printing. The data entered into the system since the latest supplement printing will be cumulated and printed during each cycle.

PROCESSING OF LIBRARY OF CONGRESS INFORMATION

The description in this section of the system definition will depart somewhat from the method of description followed in the other sections. Elsewhere in the system definition the definition has been given in a manner which is independent of the actual machine system design and does not refer to specific machine files. Here, as a matter of convenience, specific machine files implying a particular system design will be referred to. Also, some additional outputs will be defined here that are not referred to in other sections of the specifications.

Two files are used to retain the LC catalog data. These are the current item master file and the dormant item master file. The current item master file is passed on each basic cycle of the system and contains, in addition to the Library of Congress catalog records, locally generated cataloging information and acquisition information. Library of Congress catalog records would be held on the current item master file for a period of one year or until they are used in cataloging, which ever is earlier. After this they are transferred to the dormant item master file. The dormant item master file is accessed less frequently than the current item master file.

A request for Library of Congress copy is initiated by submission of a new title notice. If Library of Congress card number is known, then the search for LC copy will be carried out against the current item master file by item number. If no LC copy has been received for the item number, a proof sheet will be printed showing only what was on the new title notice, with an indication that LC copy is not available. If LC copy is found on the current item master file, then a proof sheet will be printed showing the information contained in the LC copy. If the LC copy is on the dormant item master file, there will be a cross-reference reflecting this fact on the current item file. A proof sheet will be printed containing nothing but a notice that proof copy will be prepared the next time the dormant item master file is run. If LC card number is not available, then the system will attempt to find LC copy by means of an alphabetic search on information based upon the author and title data for the item. (The precise nature of the alphabetic search has not been specified here, and will need to be determined experimentally. It is clear that an exact alphabetic match on full author and title is not desirable as a search technique). An alphabetic master file is maintained that contains the alphabetic matching data for all Library of Congress copy held in the system. The Library of Congress card number for the item is also kept on this file. If the alphabetic search is successful, then the item number is extracted from the alphabetic master file and the retrieval of Library of Congress copy then proceeds by item number as described above. It is possible that several items may be found which meet the alphabetic match criteria for the item that is being searched. In this case, proof sheets will be printed showing the Library of Congress copy that has been received for every matching item. The cataloger will select the correct sheet.

Every new title notice that is accepted by the system causes creation of a record called an acquisition record on the current item master file. The term "acquisition record" is used because this record has certain functions in connection with an acquisition system integrated with the cataloging system. If Library of Congress copy was not found at the time a search was made and if at any subsequent time Library of Congress copy is received for the item, then, if the machine is able to identify the Library of Congress record with the acquisition record on the file, the machine will at that time produce Library of Congress proof copy. If by that time the item has already been cataloged locally, then there will be a catalog record also on the item master file and this will be put out along with the Library of Congress information so that the cataloger can compare the two and decide if he wants to make changes.

If the acquisition record on the item master file has been placed there with a Library of Congress card number, then when Library of Congress proof copy comes in later there will be a definite match by item number and the proof sheets can be produced. If the acquisition record is on the file under a New York item number, then analphabetic search must be tried. The same master file that keeps the alphabetic indices of the Library of Congress records, also keeps the alphabetic indices of the new title notices. Incoming LC records will be matched against the alphabetic file and if they match any alphabetic record that have New York item numbers, the proof copy will be put out for these items.

Whenever the machine identifies a new title notice (or the acquisition record produced on the item master file from the new title notice) with a Library of Congress catalog record by means of the alphabetic match, then this must have occurred because the new title notice had a New York State item number, since otherwise the match could have been carried out by means of LC card number. In such cases, whether it be new LC copy that has matched the previously entered new title notice or a new title notice that has matched the previously entered LC copy, then when proof copy is printed out, the cataloger will by inspection of the proof copy first verify that the machine has correctly matched the two items. If this is verified, then when he enters the catalog worksheet *with the final cataloging information*, he will also indicate that an item number change is to take place from the New York number to the LC number.

If LC copy is received some months after an item has already been cataloged, then the catalog record may no longer be on the current item master file. It will, however, be on a supplement which is passed on each supplement cycle of the system. Preparation of proof copy for the newly received LC data will be delayed until the next supplement cycle, and at that time the proof copy will be put out with the catalog record that is presently in the system.

Established headings on the LC catalog record will be checked against the machine authority file at the time that the search for LC copy takes place and proof copy is prepared. One of five actions can occur as a result of this search:

1. LC copy matches an authorized entry in the authority file. The program will treat the LC information exactly as if it would have been prepared by the library, i.e., the appropriate description codes, filing and printing form will be transferred from the authority file to the catalog record, and proof copy will be printed.

2. LC copy matches a special entry on the authority file. This special entry was previously prepared by the library for the case where a form used by LC is to be changed to a form used by the library; i.e., there is a one-to-one relationship in all cases between the two forms. For example, if LC always used "Bolshevism", and the Library used "Communism" as the corresponding subject heading, then the program would convert the LC form to the library's form - Bolshevism to Communism.

3. LC copy matches a "do not establish" entry on the authority file. This entry was previously prepared for all established LC forms that the library cannot accept as is. This may be true for special collections where the library might want a finer subdivision of related subject headings, such as "Dance", "Art", etc. The program will appropriately flag this heading on the printed catalog worksheet in order to avoid unnecessary investigation by the cataloger.

4. LC copy matches a "see" reference on the authority file, but no indication has been entered on the authority file for automatic transformation to the referenced heading. The proof copy will show the heading with its cross-reference and the library can decide whether a transformation should be made.

5. LC copy does not match any previous entry on the library authority file. It will be flagged on the printed catalog worksheet and the cataloger will follow the specified procedures for investigation of new headings. If it is decided to establish the form as is, then the indicator "N" should be entered by the cataloger on a change catalog worksheet.

Working from the proof copy the cataloger would prepare a catalog worksheet on which he would indicate any changes he wanted to make in the Library of Congress copy, or the heading might very well be acceptable as is, and no changes would have to be made. In addition, he could add any information that is of strictly local significance, such as collection code. In the case of a new heading, if he decides that it should be established he could simply indicate on the catalog worksheet that this heading is to be newly established using the "N" indicator. Alternatively, he can submit an authority file worksheet.

The Library of Congress will also provide machine-readable heading cross-reference records. In a general sense, the cross-reference headings will be treated in the same manner as catalog records received from the Library of Congress. Catalog entries are first matched against the library files. If a match is found, both entries are printed for comparison. If a match is not found, the LC copy is retained until the library acquires the item and requests LC copy via the new title notice.

The same policy willhold for cross-references. The headings will first be checked against the library authority file. If the LC heading matches an established cross-reference heading and the cross-references are identical, nothing more need be done (except printed notification that LC and the library heading agree). If the headings match, but the cross-references are not alike, both will be printed on the proof copy for consideration by the cataloger. If the LC cross-reference heading matches an authority file heading for which entries have been generated, then both headings will be printed on the proof copy. The cataloger can then decide whether to change to the LC form and remove all entries from under the heading, or to retain the library's previous decision to use this established form as a heading for catalog entries. If a match is not found on the authority file, then the Library of Congress cross-references will be held on the machine authority file (specifically the authority check file) in an inactive status until the first item employing the heading to which the cross-reference applies is cataloged. At that time, a request for Library of Congress copy will have been made via a new title notice. When this copy is found it will be checked against the authority file and at that time the machine will notice that a cross-reference is present for the new heading. The cross-reference will be printed out at the bottom of the catalog proof copy sheet. The cataloger will take the cross-reference into consideration in examining the proof sheet, and if when he returns the worksheet he indicates (by entering the "N" indicator) that the new heading is to be established, the cross-reference will automatically be picked up and put into the authority file. On the other hand, if the heading is not established by means of the catalog worksheet, but a separate authority file notice is prepared, then the cross-reference must be entered on this authority file notice.

When new Library of Congress headings and cross-references finally are established either via the catalog worksheet or on an authority file worksheet they will be printed in the authority file proof copy in the same fashion as headings locally established. However, the item number of the LC record which led to establishment of this heading or cross-reference will also be given.

APPENDIX

INFORMATION THAT MUST BE FURNISHED BY THE USING LIBRARY WHEN THE CATALOG MAINTENANCE SYSTEM IS PUT INTO USE

When the system is first put into use, certain information must be supplied by the using library. This information is supplied once, is entered into the machine, and becomes a permanent part of the machine system. The information that must be supplied is the following:-

1. System Parameters

These are time periods related to various actions of the system. The meanings of these parameters are given in detail in Part II of the report - System Design. In less precise language the meanings are as follows:-

P1 - Length of time which should elapse before an unused Library of Congress Catalog Record is dropped from the active machine file and put into the dormant machine file.

P2 - Length of time after an item is cataloged locally that the machine system should continue to scan incoming Library of Congress Catalog data to see if the Library of Congress has subsequently cataloged the item.

P3 - Length of time which should elapse before an unused Library of Congress Catalog Record is dropped from the dormant machine file.

P4 - A time period that is related to the distribution of catalog data, for correction purposes, among more readily accessible and less readily accessible files.

P5 - Time that elapses between preparation of proof copy, and entry of the data into the machine catalog. This time interval allows correction to be made.

P6 - Time period for which the system retains a cross-reference from an old item number to a new item number after an item number change is made.

P7 - If the machine discovers an error in a record, and if after this elapsed time period the error has not been corrected, the record is printed out again as a reminder.

P8 - Length of time the system will retain original Library of Congress copy after cataloging is completed.

2. Input Control Notice

This describes to the computer the characteristics of the catalog worksheet that is in use. Instructions for preparing this are given in the text.

3. Output Control Notices

These describe the content, format, and sequence of book catalog pages or catalog cards. Instructions for preparing these are given in the text.